

# *Machine and Tool* **BLUE BOOK**

ESTABLISHED 1906

**OCTOBER 1951**

**Special Report on Planers**

**Using Carbides on Planer Operations**

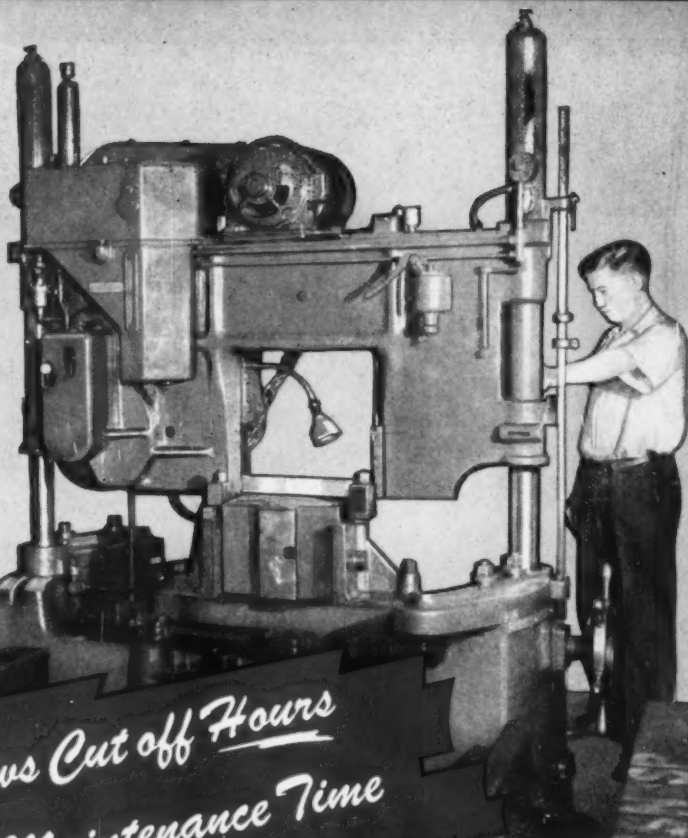
**New Gear Hobbing Machine**

**Washington News Letter**

**How's Business?**

**CONTENTS ON PAGE 5**

Below (left) is a model 9A MARVEL High Speed Production Saw with automatic bar push-up, which automatically cuts off billets to exact size (ends fin waste), and, a No. 18 MARVEL Giant Hydraulic Hack Saw for cutting off large bars and billets and trimming dies in sizes up to 18" x 18" cross section.

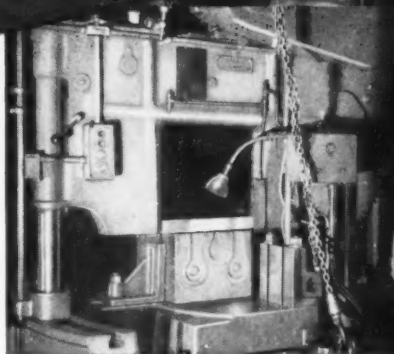


*Marvel Saws Cut off Hours  
from Die Maintenance Time*

Hubbard & Company, Pittsburgh, manufacturers of pole line hardware, picks, hammers and other drop forged specialties, use MARVEL Saws to eliminate tedious hours in making and maintaining their giant forging dies. Not only do these saws do all regular cutting-off of steel for the machine shop, die blocks for die shop and exact size billets for the forge shop, they also materially cut the cost of die maintenance.

Previously, it was necessary to plane the face of dies being reworked. This was a long and tedious job because the die face is always work-hardened with hard spots that had to be chipped or ground out before the planer tool could make a cut. Now with MARVEL Saws, the face of a die is speedily and accurately "skinned"—a thin slice is sawed off just behind the hard spots. After this speedy "skinning" and a single facing cut on the planer, the die is ready for the die sinker. This modern MARVEL method is saving Hubbard a lot of dies, materials, labor and machine time.

For quick reference see our section in Sweet's File—Mechanical Industries or write for catalogue.



**ARMSTRONG-BLUM MFG. CO.**

*"The Hack Saw People"*

**5700 Bloomingdale Ave.**

**Chicago 30, U.S.A.**

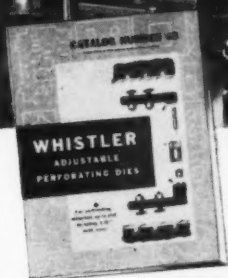


*Get into Production in a few hours  
with*

# **WHISTLER ADJUSTABLE DIES**



Whistler Adjustable  
Perforating Dies are  
in use everywhere...  
working in both large  
and small presses.



There are plenty of other advantages in using Whistler Adjustable Dies. It makes sense to get the complete story. And it's easy to do. Write for your Whistler Catalog today.

Whistler perforating dies now offer a double-barreled advantage in getting into production faster. Standard sizes of round hole punches and dies...  $\frac{1}{32}$  to 3"... can be shipped promptly. Special shapes... squares, ovals, rectangles, group and notching dies, are quickly made to order.

Equally important, set-ups are simple... take only a short time. Same units can be rearranged or units added in setting up different jobs. Production is thus speeded while die costs are amortized through continued re-use. No special tools are needed. All parts are interchangeable. The heavy duty series of punches and dies easily pierce materials up to  $\frac{1}{4}$ " mild steel.

## **S. B. WHISTLER & SONS, INC.**

760 MILITARY ROAD

BUFFALO 17, NEW YORK

# Wade®

No. 7

## HAND SCREW MACHINE

**HOLD CLOSE PRECISION TOLERANCES!**

The case hardened tool blocks are cut away, so you can get closer to the spindle than with any other type of tool block.

7" swing Spindle speeds, 315 to 3300 RPM  
1" collet with superior characteristics  
4-to-1 Hi-Lo Speeds at finger tips  
Spindle stops without stopping motor



*Send for Catalog*

**THE WADE TOOL CO., 51 River St., Waltham, Mass.**

## Production up from 80 to 300 pieces per hour with a Warner & Swasey 5-Spindle Automatic

● In 1940 Badger Meter Manufacturing Company of Milwaukee worked three shifts to turn out their required production. Today they are able to achieve the same output with one shift, using the same floor space for production.

*Practically all of these results are due to more efficient machine tools.*

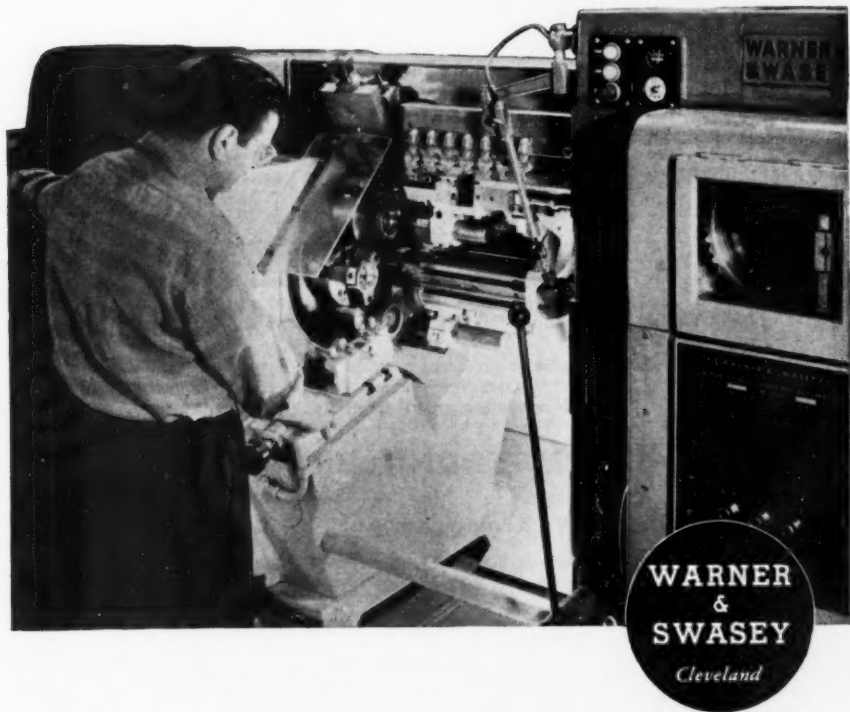
For instance, when Badger installed a Warner

& Swasey 5-Spindle Automatic Chucking Machine, they had one main purpose in mind—to step up production. It did just that. Output on the standard register housing, used on all Badger meters for liquids, rose from 80 to 300 pieces per hour! In addition, better surfaces and closer tolerances were attained.

Badger, like many a manufacturer who is hard

pressed for production during these critical days, has found the Warner & Swasey 5-Spindle Automatic an answer to a prayer. For in addition to improving work quality and stepping up production, it does this with fewer operators.

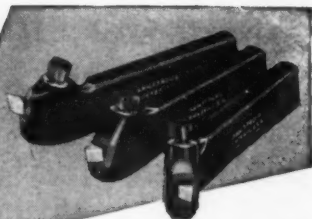
If these facts hit home, call in your nearest Warner & Swasey Field Representative. He'll be glad to help you boost your man-hour output.



YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES



# ARMSTRONG TOOL HOLDERS



answer both . . .

1. The problem of lowering costs
2. The problem of increasing output

By providing permanent, multi-purpose, inexpensive ARMSTRONG TOOL HOLDERS that use cutters or bits that are quickly ground from standard high speed shapes (Saving: All Forging, 70% Grinding and 90% High Speed Steel), the Armstrong System of Tool Holders will reduce your tool cost to an absolute minimum.

By providing stronger, more efficient tools, carefully developed for each operation, as well as ARMSTRONG High Speed Steel, ARMALLOY Cast Alloy Cutter Bits or Armide Carbide-Tipped Cutters as required for each job, ARMSTRONG TOOL HOLDERS permit greatly increased speeds and feeds, enable you to increase the hourly output of every lathe, planer, slotter, shaper, turret lathe and screw machine.

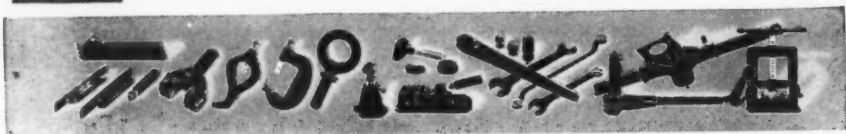
There is no surer way to lower costs and increase output, than to use the correct ARMSTRONG TOOL HOLDER for each operation on all machines.

## ARMSTRONG BROS. TOOL CO.

*"The Tool Holder People"*

5208 W. Armstrong Ave. Chicago 30, U.S.A.

Eastern Warehouse and Sales: 199 Lafayette St., N. Y. 12, N. Y.  
Pacific Coast Whse. & Sales Office: 1275 Mission St., San Francisco 3, Calif.



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Hitchcock district managers are listed on page 317

Accepted under section 34.64, P. L. & R, authorized office, Chicago, Ill.

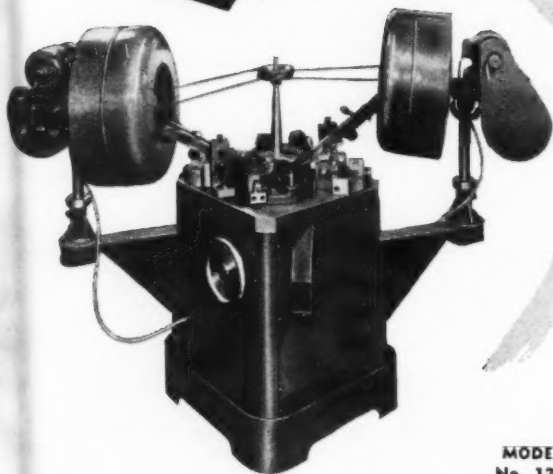
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FOR SPEEDIER  
THREAD ROLLING  
TRY THE

ROLLMASTER



MODEL  
No. 125

### PLANETARY THREAD ROLLING MACHINE

PRODUCTION..... 25,000 Threaded parts per hour  
TOLERANCE..... Class 3  
DIE LIFE..... 3 to 5 MILLION pieces per set  
CAPACITY.....  $\frac{1}{4}$ "x2" Threads.

\*Also available for threading letter ring and spiral nails, stud bolts and many knurling, marking, serrating, necking and contour operations

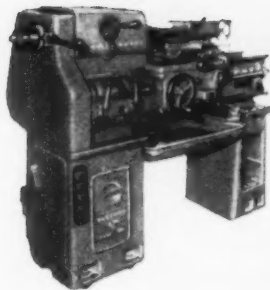
INFORMATION available on this machine and on the #200 ROLLMASTER Planetary Thread Rolling Machine for threads  $\frac{1}{2}$ "x3"

# D. H. PRUTTON

Machinery Co.

5295 W. 130th ST.

CLEVELAND 11, OHIO



Low initial tool investment, minimum setup time, simple setup changes on a wide variety of jobs, and more work turned out per working day . . . these are the

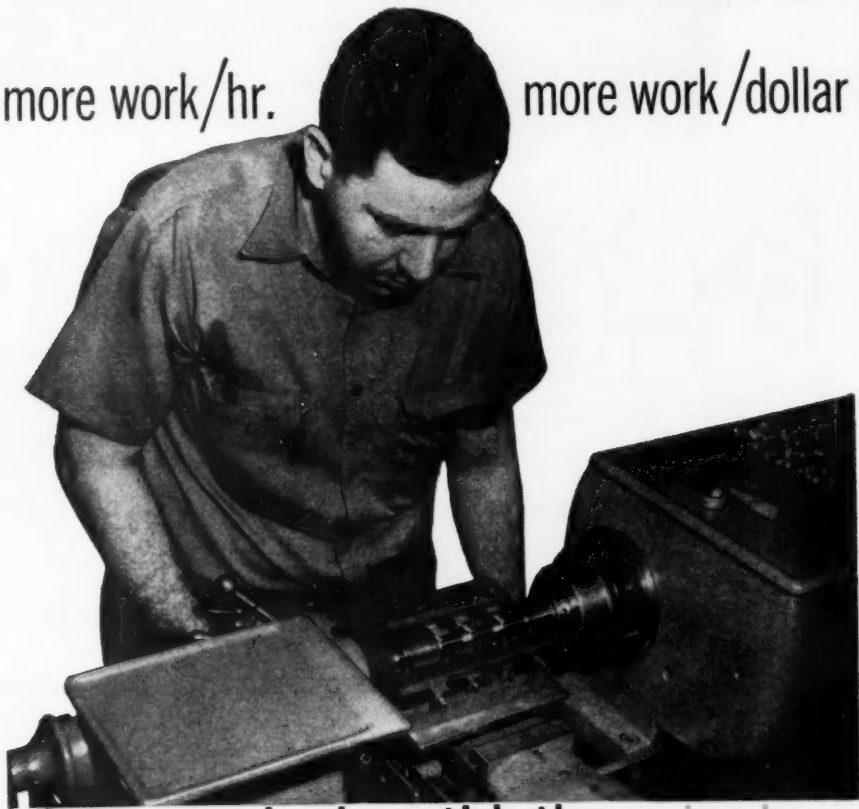
chief reasons why American Lava Corp., Chattanooga,

Tenn., bought Cincinnati Tray-Top light duty engine lathes for turning ceramic condenser shafts. Tray-Top proved a sound investment. Mr. R. B. Williams, ceramic engineer, reports: "With a multiple tool block on the lathe compound two or more brass sleeves are turned on the shafts simultaneously. Diameters are easily held within plus or minus half a thousandth.

Tray-Tops' low cost saved us substantially on our original investment and are well adapted to our operation." Catalog available on request.

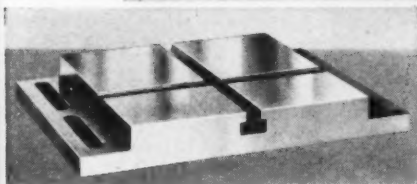
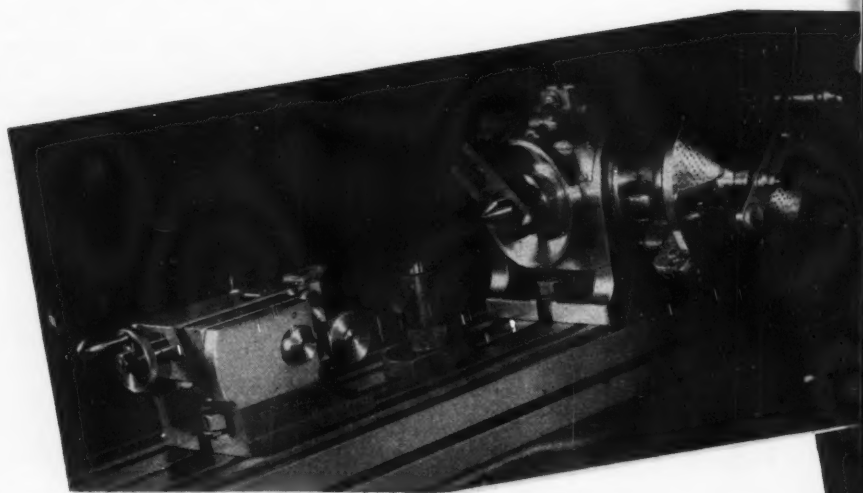
more work/hr.

more work/dollar

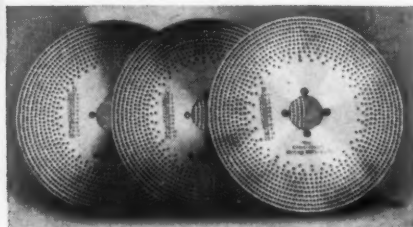


CINCINNATI 9,  
OHIO, U.S.A.

cincinnati lathe & tool co.



**▲ RIGHT ANGLE PLATES** for offsetting the Dividing Head from the table T-slots, or setting it up to face the machine spindle. Publication M-644-1.



**▲ HIGH NUMBER INDEXING ATTACHMENT.** These plates interchange with standard index plate supplied with CINCINNATI Dividing Heads. Publication M-987.

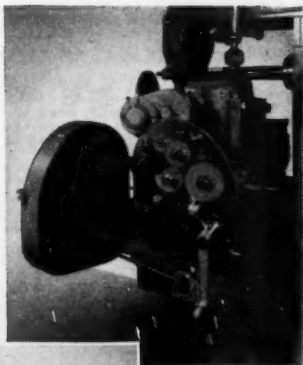
Easily the star performer on milling machines, the CINCINNATI Dividing Head has a strong supporting team of eight attachments which gives it extra value in any shop. Each attachment lends a hand in milling specific types of dividing head work. Some of them can be employed to advantage in your shop. It's easy to see how; just look at the whole team pictured here. Then write for literature on the ones in which you are interested.

**THE CINCINNATI MILLING MACHINE CO.**

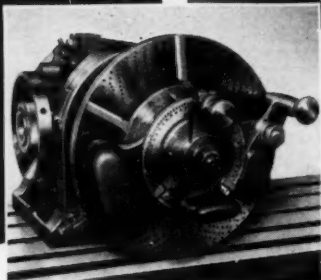
**CINCINNATI 9, OHIO**



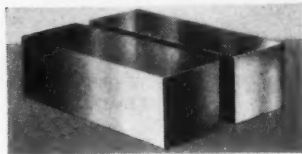
# SUPPORTING TEAM for the STAR PLAYER



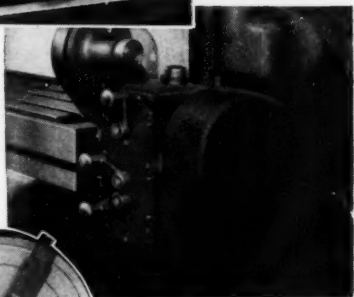
▲ **ENCLOSED DRIVING MECHANISM** for driving Dividing Heads mounted on the newer CINCINNATI plain, universal, and vertical millers. Lead range  $2\frac{1}{2}''$  to  $100''$ . Publication M-1016-2.



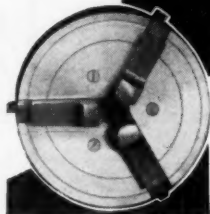
▲ **WIDE RANGE DIVIDER.** A built-in unit for divisions up to 400,000. Exact angular divisions, too, intervals of six seconds. Publication M-972-1.



▲ **RAISING BLOCKS.** Give your Dividing Head the benefit of accurately made Raising Blocks. Supplied in pairs:  $2''$ ,  $2\frac{1}{2}''$  and  $3''$  high. Publication M-644-1.



▲ **SHORT AND LONG LEAD DRIVING MECHANISM** for driving Dividing Heads mounted on Universal Dial Type Millers only. Lead range  $.010''$  to  $1000''$ . Publication M-1166.



➔ **CHUCK.** Three jaw universal type. Has threaded flange to facilitate mounting on spindle nose of Dividing Head.  $6''$  and  $9''$  sizes. Publication M-644-1.

## CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES  
DROACHING MACHINES • FLAME HARDENING MACHINES  
OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

TELL US YOUR PRODUCTION PROBLEMS . . .  
WE'LL HELP YOU SOLVE THEM

# "LOGAN" AIR AND HYDRAULIC EQUIPMENT

SINCE 1916



Logan plant floor area,  
over 100,000 sq. ft.

Logan production equip-  
ment, over 150 modern  
productive machine tools.

Logan's approximately  
500 employees have an  
average of 10 years with  
the company . . . a contin-  
uous service total of 5,000  
man-years.

Logan manufactures  
6,975 standard cataloged  
items.

Logan serves more than  
6,000 customers annually;  
99.6% satisfied.

Let Logan engineers help  
you design your Air and  
Hydraulic Circuits.

## *Free Catalog on Request*

**AIR CONTROL VALVES**  
CATALOG 100-4

**AIR CHUCKS**  
CATALOG 70-1

**AIR CYLINDERS**  
CATALOG 100-1

**AIR and HYDRAULIC PRESSES**  
CATALOG 51

**COLLET GRIP TUBE FITTINGS**  
CATALOG 44

**HYDRAULIC CONTROL VALVES**  
CATALOG 200-4

**HYDRAULIC CYLINDERS**  
CATALOG 200-2; ALSO 80-2

**HYDRAULIC POWER UNITS**  
CATALOG 200-1

**SURE-FLOW COOLANT PUMPS**  
CATALOG 62

# Logan

*Air and Hydraulic Equipment*

SAVES  
• TIME  
• EFFORT  
• MOTION

LOGANSPORT MACHINE CO., INC.

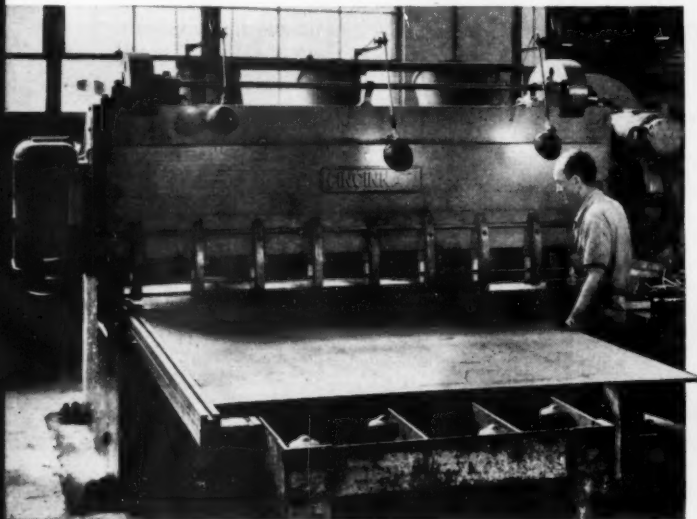
803 Center Ave.  
Logansport, Ind.

**FLUID POWER SPECIALISTS SINCE 1916**



• BAKER-RAULANG COMPANY, says:

## a Cincinnati Shear brought these results



- |   |                        |
|---|------------------------|
| 1 | lower costs            |
| 2 | stable deliveries      |
| 3 | steady stock supply    |
| 4 | flexible manufacturing |

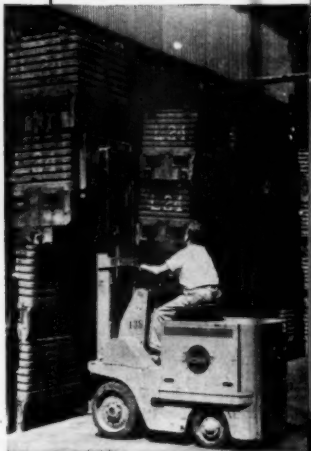
With the installation of this Cincinnati Shear, a do-it-yourself program replaced dependence on outside sources at the Baker-Raulang Company, manufacturers of industrial trucks.

Sheets of any required size are now sheared without delay and are always ready for assembly when needed. This results in a smoother, controlled manufacturing schedule, reduced inventory and, at the same time, improved deliveries.

The accurate performance of Cincinnati Shears reduces shearing costs—savings in subsequent fabricating operations result from better fits.

If you use sheared sheets, a Cincinnati Shear in your own shop may save you money.

Write for Catalog S-5—covering the very complete line of Cincinnati All-Steel Shears.



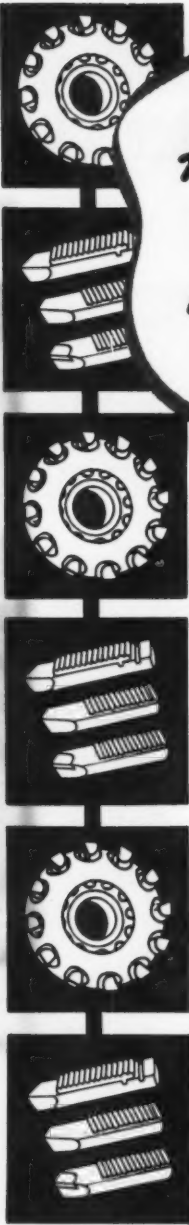
*Photos courtesy Baker-Raulang Company, Cleveland, Ohio*



### THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS • SHEARS • BRAKES



*All Lovejoy Blades for  
Type "A" Milling Cutters  
are interchangeable from  
4½" to 24" in diameter*

... and this applies to  
every "A" cutter ever made!

Lovejoy Type "A" face milling cutter blades offer unsurpassed economy — 1) they are interchangeable throughout the complete range of housing sizes, 2) H.S.S., carbide and cast alloy blades are interchangeable in every housing, 3) every blade will fit every Type "A", even if you have housings 30 years old, 4) only a minimum of stock must be removed when sharpening, 5) a large percentage of every blade is usable; 6) there is no need to carry a large inventory, as Lovejoy can supply blades promptly from stock. For superior performance, plus maximum economy, use Lovejoy Type "A" for every face milling job.

Write for free catalog!



136 MAIN ST., SPRINGFIELD, VERMONT

**LOVEJOY**  
**TOOL COMPANY, INC.**

**CUSTOM  
MADE  
at NO  
EXTRA  
CHARGE**

*Jarvis*

**TECNI-TAPS**



ACCURATE  
SQUARES

CONCENTRIC  
SHANKS

UNIFORM  
FLUTE  
SPACING

CONTROLLED  
HOOK

PRECISION  
GROUND  
CHAMFER



You pay nothing extra for having Jarvis Tecni-Taps custom made. Depth and width of flutes, hardness, hook, proper chamfer and other vital factors are carefully determined by qualified Jarvis personnel. The result — a ground-from-the-solid Tecni-Tap that gives you the maximum in accurate, long-lived, trouble-free service.

Call in the Jarvis factory-trained service engineer. He will gladly help you with your tapping requirements — show you how Jarvis custom-made Tecni-Taps can save you money and increase productivity.

For additional literature, write: The Charles L. Jarvis Co., Middletown, Connecticut.

*Jarvis*  
**POWER  
TOOLS**

TAPPING ATTACHMENTS • TECNI-TAPS and DIES • ROTARY FILES  
FLEXIBLE SHAFTS and MACHINES • QUICK CHANGE CHUCKS and COLLETS

THE CHARLES L. JARVIS CO., MIDDLETOWN IN CONNECTICUT

# big machine performance

*at small machine cost*

## **BOYAR-SCHULTZ No. 6-12 SURFACE GRINDER**

A PRECISION Surface Grinder with the type of accuracy that has always been associated with larger and more costly machines.

It is speedy and proper location of controls makes it unusually convenient to operate.

Users of the Boyar-Schultz No. 6-12 Surface Grinder tell us they obtain flatness, vertical and parallel tolerances that compare with the best work of any other surface grinder, regardless of size.

It is the kind of machine that is turned to instinctively for intricate gage work.









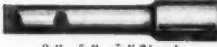





*Write for Circular.*

**BOYAR-SCHULTZ  
NO. 6-18  
TOOL ROOM  
SURFACE  
GRINDER**



**BOYAR-SCHULTZ  
CORPORATION**  
2108 Walnut Street, Chicago 12, Illinois

# APEX Bit Holders to fit your guns...

		
1/4" 24 Screw Shank Drive	1/4", 3/16", 7/32", 1/8" Hexagon Drive	Keller 1/4" 20 Screw Shank Drive
		
1/4" Sq. Quick Change Drive	Haskins Drive	Millers Falls Dyno-Mite, 1/4" Hex
		
8/32", 5/16", 3/8" Shank for Spiral Drivers	Buckeye-Desoutter 1/8" Hex Drive	Thor 5/16" Sq. Shank Drive
		
Keller 10-32 Screw Shank Drive	Keller Tang Drive	Millers Falls Tang Drive

## and APEX Insert Bits to drive your screws...



will **reduce** your fastening costs...

Apex bit holders and insert bits—an exclusive, patented Apex development—will help you save on tool costs, reduce bit inventories and fastening costs, and conserve vital steel supplies.

Bit holders, made to fit all popular makes of air, electric or spiral drivers, last indefinitely, and the

low-cost insert bits may be quickly and easily replaced when worn. The same insert bits can also be used with Apex hand drivers and service drive bit holders for impact tools.

Catalog 20 lists the complete line of Apex screw-driving tools... write, on your company letterhead please, for your copy.

# APEX TOOLS

## bit holders and insert bits

THE APEX MACHINE & TOOL COMPANY

1028 S. Patterson Blvd., Dayton 2, Ohio

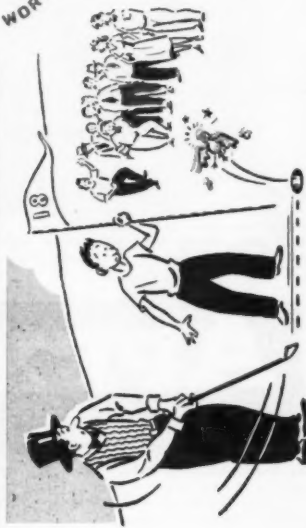
Safety Friction Tapping Chucks • Vertical Float Tapping Chucks • Self Releasing and Adjustable Stud Setters  
Power Bits for Phillips, Frearson, Slotted Head, Clutch Head, Hex Head and Socket Screws • Hand Drivers  
for Phillips, Frearson and Clutch Head Screws • Aircraft and Industrial Universal Joints • Sockets and Universal Joint Socket Wrenches.



# TAPPING TECHNIQUES No. 12



Both Topper and Tapper were "matched" nip and tuck.  
The result at each "green" was a matter of luck.



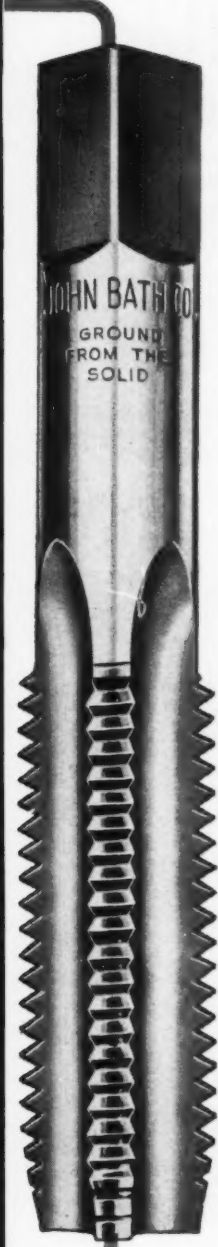
One look . . . then Topper, with a club that was sturdy  
Sunk a short "putt", to score with a "birdie".



'Til they came to the last and most hazardous hole —  
The "strokes" were all even . . . the club house their goal.



It's locker-room gossip how friend Tapper won —  
With Bath Tap Technique . . . for a clean "hole-in-one".



## INSIST ON BATH TAPS . . . PROFIT BY THEIR PLUS-PERFORMANCE

You'll never get into a "sand trap" if you base your use of taps on the number of threaded holes per dollar, for you'll find Bath ground thread taps way over "par" for the number of threaded holes per tap.

There's nothing secret about Bath Tap Technique . . . if you'll select the proper type of tap with relation to (a) the

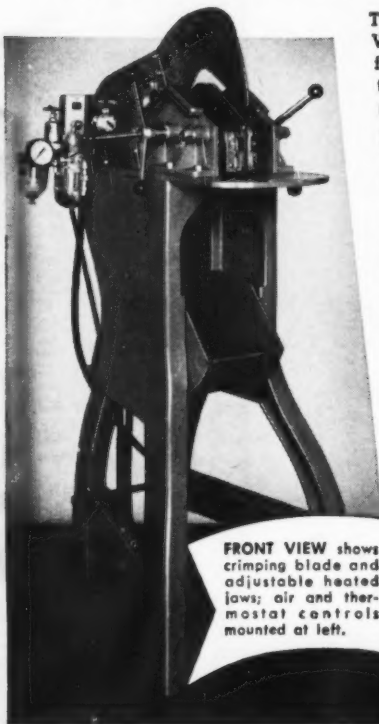
kind of material (b) the thread size (c) the tolerances required . . . taking into consideration the tapping machines and equipment available. With this information, Bath Taps give you the proper "stance" for a good, clean "hole-in-one" every time you "tee off" for mass production. Let us help you with your tapping "hazards" and improve your "score".

PLUG AND RING THREAD GAGES • GROUND THREAD TAPS • INTERNAL MICROMETERS

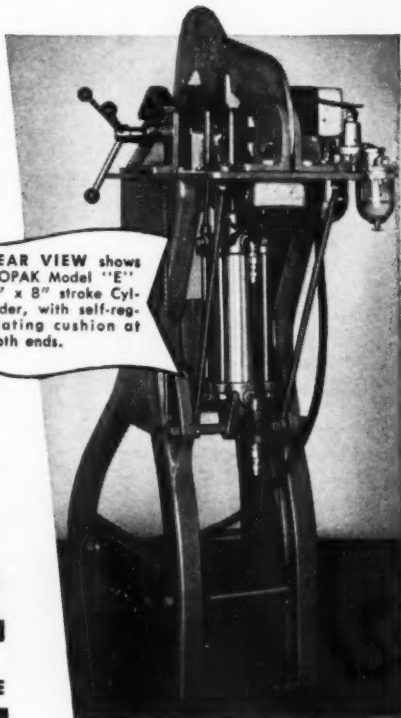
**JOHN BATH CO.** INCORPORATED  
14 Grafton St., Worcester, Mass.

# Leather Crimping Machine

## *Air-Powered* by NOPAK CYLINDER



FRONT VIEW shows crimping blade and adjustable heated jaws; air and thermostat controls mounted at left.



REAR VIEW shows NOPAK Model "E" 4" x 8" stroke Cylinder, with self-regulating cushion at both ends.

The crimping machine pictured was developed by Western Supplies Co. of St. Louis. It "makes shoes fit better" because it pre-forms leather upper sections, under heat and pressure, so that they can be subsequently drawn snugly against the lasts.

NOPAK Air Cylinder Power was chosen to reduce operator fatigue and increase production . . . to utilize controlled line pressure over the full range of crimping operations . . . to eliminate working parts . . . and because NOPAK mounting characteristics were best fitted to the machine. A study of the cylinder's construction indicated there was "practically nothing to wear out." It was also found to meet the high standards required at a comparatively low price.

**GALLAND-HENNING MFG. CO.**

2754 S. 31st St. • Milwaukee 46, Wis.

Representatives in Principal Cities.

Write for Bulletin SW-1 or refer to Sweet's File for Product Designers.

**NOPAK**  
VALVES AND CYLINDERS  
DESIGNED for AIR and HYDRAULIC SERVICE

# FOUR BONUS FEATURES OFFERED BY *Improved* SUNOCO EMULSIFYING CUTTING OIL

1. Better metal-wetting characteristics and detergent properties. *Improved Sunoco Emulsifying Cutting Oil* means cleaner machines and longer wheel life on grinders.
2. Better rustproofing action. *Improved S.E.C.O.* gives even more protection.
3. Faster mixing in water. *Improved S.E.C.O.* requires less stirring, shorter emulsion preparation time.
4. Better operator acceptance. *Improved S.E.C.O.* forms a pleasing, cream-colored emulsion.

## IN ADDITION YOU GET THESE SIX ESTABLISHED FEATURES

1. Superior lubricating and heat-absorbing characteristics—making *S.E.C.O.* particularly suitable for accurate, high-speed production.
2. Increased tool life—another *S.E.C.O.* contribution to profitable operations.
3. Utmost in economy—low initial cost, plus increased production.
4. Will not turn rancid or permit the growth of bacteria which cause skin inflammation—remains hygienic and pleasant smelling.
5. Forms stable emulsions.
6. Does not deteriorate in storage.

FOR COMPLETE INFORMATION ON IMPROVED SUNOCO EMULSIFYING CUTTING OIL, CALL THE NEAREST SUN OFFICE

**SUN INDUSTRIAL PRODUCTS**

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL



# **STEEL CHIPS 2" WIDE** **3/16" THICK**

**hogged off with  
Davis "Clamped-on"  
H.S.S. Cutters**



These Davis cutters and holders are designed especially for heavy-duty frog and switch planing operations.



Two Davis holders accommodate all of the cutters necessary for frog, switch and guard rail planing operations.



**DAVIS BORING TOOL DIVISION**  
**GIDDINGS & LEWIS MACHINE TOOL CO.**  
**FOND DU LAC, WISCONSIN**

## **Sturdy Cutters and Holders Reduce Floor-to-Floor Time to 18 Minutes in Producing Two Rail Components for Track Switch**

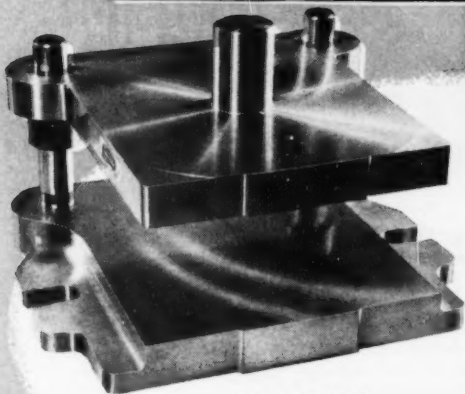
Job-engineered Davis cutting tools easily meet heavy-duty machining demands of frog, switch and guard rail work. A typical example of tools in use is shown in this planing operation. Metal from two 100-lb. steel rails is hogged off in ribbons 3/16" thick and 2" wide in a single pass of the planer. The sturdy Davis "Clamped-On" type H.S.S. cutters and massive holders make it practical and common to use this machine feed.

Depend upon Davis cutting tools to remove metal faster and more accurately in all types of railroad machining. Before tooling new machines or retooling present machines, ask experienced Davis engineers for recommendations.



# 28 YEARS

## OF PROVED PERFORMANCE



**DANLY  
PRECISION  
DIE SETS**

**DANLY  
DIEMAKERS  
SUPPLIES**



More than 28 years of prompt, complete service has made Danly the first choice of diemakers everywhere.

Danly precision makes every Danly Die Set a reliable base for the finest die work... and every Danly Supply item a dependable time-saver.

A nationwide system of completely stocked assembly branches assures fast, convenient service. For the finest, specify Danly.

CALL ON THE DANLY BRANCH  
CLOSEST TO YOU FOR FAST LOCAL SERVICE

\*CHICAGO 50, 2100 South Laramie Avenue

\*CLEVELAND 14, 1550 East 33rd Street

\*DAYTON 7, 3196 Delphos Avenue

\*DETROIT 16, 1549 Temple Avenue

\*GRAND RAPIDS, 113 Michigan Street N.W.

INDIANAPOLIS 4, 5 West 10th Street

\*LONG ISLAND CITY 1, 47-26 37th Street

\*LOS ANGELES 54, Ducommun Metals & Supply Co.,  
4890 South Alameda

MILWAUKEE 2, 111 East Wisconsin Avenue

PHILADELPHIA 44, 18 West Chelton Avenue

\*ROCHESTER 4, 16 Commercial St.

\*Indicates complete stock



**DANLY MACHINE SPECIALTIES, INC.**

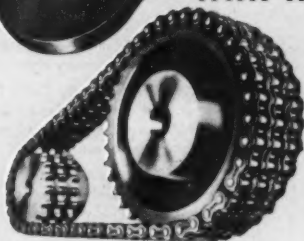
2150 South Laramie Avenue

Chicago 50, Illinois

# PRODUCTO

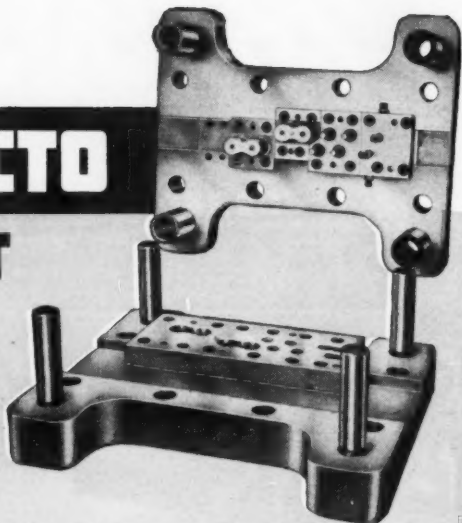
## DIE SET

AIDS  
WHITNEY CHAIN  
COMPANY...



Buy Producto Special and Catalog Die Sets... play safe when performing heavy duty stamping operations. If you haven't already received our new #10 Producto Die Set Catalog, write today for your copy.

Call Producto in your classified telephone directory. Representatives in 36 main stamping centers.



WITH HEAVY DUTY PRODUCTION JOB !

The progressive 4 pin Producto Die Set shown provides the accuracy and ruggedness required to emboss, pierce and blank Pin Link Plates for Whitney Roller Chain Drives... 2 at a time... on a Niagara press.

### OPERATIONS

- Station No. 1 — Whitney Chain markings are clearly embossed for each link.
- Station No. 2 — Four holes, two to a link, are rough pierced.
- Station No. 3 — Two chain links are blanked out on each press stroke.

### TOLERANCES

- Hole diameter + .0005" — .0005"
- Hole centers + .001" — .001"
- Link Contour + .005" — .010"
- Die Set face parallel to feed slot + .002" — .002"

### PRODUCTION RATE

- 153,000 links blanked per 40 hour week.
- Between grinds, 75,000 pieces.

### MATERIAL

- 3/4" thick SAE 3140 hot rolled steel in coiled stock

**THE PRODUCTO MACHINE COMPANY**

960 HOUSATONIC AVE., BRIDGEPORT 1, CONNECTICUT

ALSO MAKERS OF TOOL AND DIE ACCESSORIES, VISES, MACHINERY

3P0081

# SAVES 5 1/2 HOURS GRINDING FORM TOOL

## DoALL "COOL-GRINDING" PRINCIPLE

(U. S. PATENT NO. 2470350)

**MAKES POSSIBLE FASTER WORK,  
GIVES STRAIGHTER CUT,  
PREVENTS WARPING**

TAKE a tip from Biddle Screw Products, Sheridan, Indiana. The carbide bar in one of their large screw machines would warp under normal cutting conditions. The cut was taking 3/4 of a day and the piece wasn't always satisfactory.

Then they turned to DoALL "Cool-Grinding" of the carbide bar. The coolant flows *through* the wheel and atomizes at the point of work. *Standard wheels are used.*

**RESULTS?** No warping, a straight cut, perfect pieces—and *only 30 minutes to do the job!*

You wouldn't believe tool grinding could be that important, but DoALL "Cool-Grinding" *does* produce amazing results everywhere it is used.

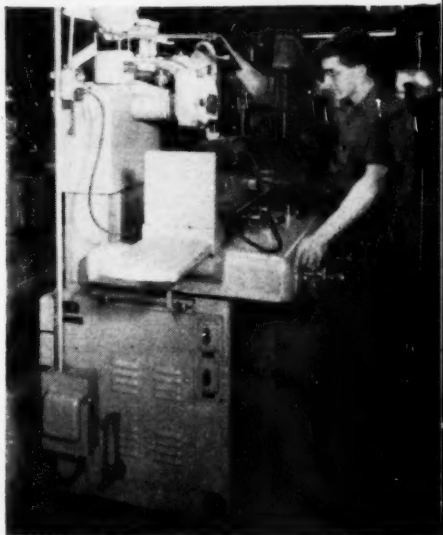
**SEE FOR YOURSELF.** Ask to have a Free DEMONSTRATION right in your own plant. Call your local DoALL Sales-Service Store or write:

### THE DoALL COMPANY

254 N. Laurel Ave., Des Plaines, Ill.

#### SEND FOR CATALOG TODAY

*Lists all models of DoALL Precision Grinders for tool-room and production work.*



#### "COOL-GRINDING" COOLS AT POINT OF CONTACT...



Coolant is metered into the hub of the wheel, forced centrifugally through the pores and out in a fine mist at the point of contact of wheel and work.

INDUSTRY'S  
NEW  
TOOLS

27  
SALES-  
SERVICE  
STORES

# DoALL



Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supplies

*Here's Proof*  
**The New Thompson Type 2F is a  
 SUPER PRECISION  
 Tool Room Grinder**



*Thompson Type 2F Grinder, Grinds Gage Blocks,  
 Grinds Tool Room Grinders, Grinds  
 Grinders, Grinds Grinders, Grinds Grinders*

**WEBBER GAGE COMPANY**  
 12500 TRISKETT ROAD - CLEVELAND 8, OHIO

November 10, 1950

Mr. Wilson, Vice President  
 Thompson Grinder Company  
 Springfield, Ohio

Dear Mr. Wilson:

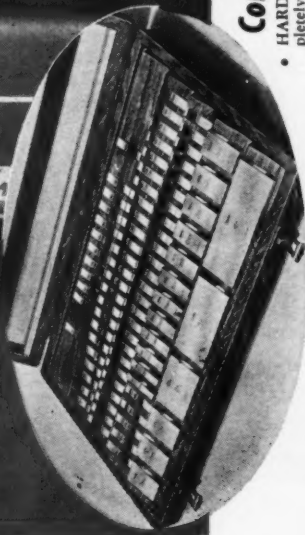
We recently installed a new THOMPSON Tool Room  
 Grinder to grind Gage Blocks to our specifications and  
 tolerances. The results have been very satisfactory and  
 in spite of the close limits to which the work has to be  
 done. We thought you would be interested in the per-  
 formance of this machine.

Very truly yours,  
**WEBBER GAGE COMPANY**

*George D. Webber*  
 George D. Webber

Thompson 2F Grinder photographed in the Webber Gage Co., Cleveland Plant

## COMPARE THIS NEW 8 x 10 x 24 TOOL ROOM GRINDER



*When working to a tolerance of four millionths of an inch such as is observed when making Webber Gage Blocks, the rough or preliminary grinding plays an important role in keeping cost of the final finishing within reasonable limits.*

### Compare These Features:

- HARDENED AND GROUND cross slide ways completely sealed.
- One shot lubrication to cross slide ways and internal saddle bearings.
- HARDENED AND GROUND sealed anti-friction vertical slide.
- HARDENED AND GROUND BED WAYS with automatic lubrication.
- 3600/1800 R.P.M. 2 speed wheel head. Heavy alloy steel spindle heat treated, runs in super precision ball bearings accurately preloaded, lifetime lubricated.

### Handy control panel.

- Elevation micrometer stop graduated in .0001".
- GROUND THREAD FEED SCREW.
- Automatic wheel TRUING device.
- Longitudinal hand wheel with automatic engagement.
- Hydraulic head movement throttle with rapid traverse.
- Hydraulic table movement throttle.
- Elevating hand wheel graduated in .0005".
- GROUND THREAD FEED SCREW.

WRITE TODAY for complete specifications and performance data. Address Dept. 14 Thompson Grinder Co., Springfield, Ohio

COPYRIGHT 1951 BY THE THOMPSON GRINDER CO.

➡ The only manufacturer of a complete range of heavy duty and light duty surface and contour grinders for industry.

# Thompson SURFACE Grinders

The Thompson Grinder Company, Springfield, Ohio

# LAYOUT FLUID

FOR ANY METAL

Send for

FREE SAMPLE

Your local supply house carries Dayton Rogers' Layout Fluid.

Applicable to all metal. One merely wipes the surface clean and then brushes on the Layout Fluid.

Dries Instantly. No waste. Scribed lines are pronounced and contrast to the dark blue background, thus relieving eyestrain.

Assures greater accuracy and speeds up work. You will save time and money on all layout jobs.

A sample is waiting for you. Send for it today.



**DAYTON ROGERS**  
*Manufacturing Company*  
MINNEAPOLIS 7, MINNESOTA



# This DoALL Gage Equipment



makes  
**120,000  
SNAP GAGES**  
accurate in millionths  
at about  
**1/4 cent each!**



A SET of 83 DoALL Gage Blocks plus the Gage Holders and Caliper Jaws illustrated gives you thousands of go and no-go snap and internal gages for a fraction of a penny each—in a jiffy. You get millionth accuracy and dimensional stability that you can depend upon.

DoALL Gage Blocks are no luxury. They are reliable, economical working tools every plant should have—dependable insurance against rejects. Ask to have a DEMONSTRATION in your plant. Call your local DoALL Sales-Service Store or write: THE DoALL COMPANY, 254 N. Laurel Ave., Des Plaines, Ill.

## MODERN MEASUREMENT CONTROL

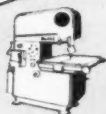
Send for this new 20 page Bulletin describing DoALL Gage Blocks and Accessories. Ask about DoALL Calibration Service for your present gage blocks!



27  
SALES-SERVICE  
STORES

# DoALL

INDUSTRY'S  
NEW  
TOOLS



Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supplies

# SPEEDY AIR VISE

**SPEEDS UP**

✓ MILLING

✓ PUNCHING

✓ DRILLING

✓ BENDING

✓ TAPPING

✓ RIVETING



**FOOT  
CONTROLLED!**

## GRIPPING FORCE 15 TIMES AIR LINE PRESSURE

Speedy Air Vise helps you do dozens of operations faster, better, cheaper—by air pressure! Foot control valve opens and shuts vise instantly, leaving *both* hands free to produce *more*! Jaw opens up to 3 inches, holds castings, parts, jigs, etc. Compact, trouble-free, inexpensive.

Complete with Foot Control Valve, Air Hose and Fittings . . . only **\$29.90**

ORDER FROM YOUR MILL SUPPLY DEALER OR WRITE DIRECT



### AIR REGULATOR

Precision - built.  
Delivers pressures  
up to 140 lbs. With  
gauge, \$4.95  
Less gauge,  
\$2.95

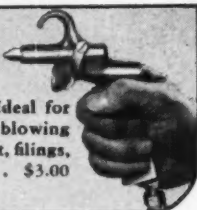


### AIR FILTER

Keeps water  
and particles  
out of the  
regulator and  
pneumatic  
tools. \$2.45

### BLOW-GUN

Looks and  
operates  
like a gun. Ideal for  
cleaning and blowing  
out chips, dust, filings,  
scraps, etc. . . \$3.00



W. R. BROWN CORP. • 2651 N. NORMANDY AVE. • CHICAGO 35, ILL.



## with an hour off for lunch!

This mountain of die castings is the eight-hour production of one man and a Cleveland Die Casting Machine, working in the shop of a leading West Coast die-caster. The shop reports this Cleveland machine puts out 30% more production than the equipment previously used . . . and their casting quality improved materially. The uniform, porosity-

free "hardware finish" castings turned out by Cleveland enabled the firm to meet their production schedules and also permitted them to accept new business they could not handle before.

You will produce better castings, faster, at less cost with Cleveland Die Casting Machines. Investigate their advantages for your production.

*Remember, Cleavelands Cut Costs*

**THE CLEVELAND AUTOMATIC MACHINE COMPANY**

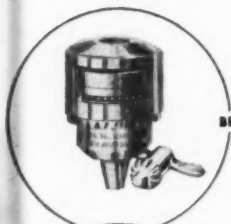
**4934 Beech Street  
Cincinnati 12, Ohio**

Sales Offices: Chicago  
Cleveland - Detroit  
Hertford - So. Orange

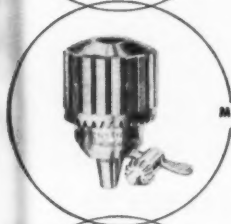
Manufacturers of a Complete Line of Single Spindle Automatic Screw Machines and High Pressure Hydraulic Die Casting Machines

# F OREMOST IN CHUCKS...

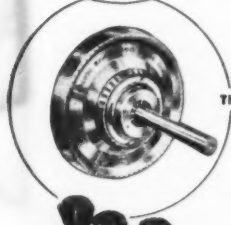
**Unmatched For Accuracy And Gripping Power,  
Jacobs Chucks Are Vital Links Between  
Power Tools And The Finished Job**



**BEYOND ALL COMPARISON.** Say "Jacobs Ball Bearing Super Chuck" and you've mentioned the last word in drill chucks. No other chuck ever made compares with this blue-chip wonder — in which Jacobs' famous ball bearing construction, tough alloy steels and precision workmanship combine for the tightest practical grip and great accuracy. That's why the Jacobs Ball Bearing Super Chuck is tops throughout the world for heavy-duty drilling.



**MOST WIDELY USED DRILL CHUCK IN THE WORLD.** Made of the same rugged materials and to the same close tolerances as the Jacobs Ball Bearing Super Chuck, the Jacobs Plain Bearing Chuck is particularly designed for portable tools and light and medium duty drill presses and lathes. Because of its matchless gripping power and accuracy it has been incorporated as standard equipment by the overwhelming majority of portable tool users both here and abroad.



**THE WORLD'S OUTSTANDING LATHE COLLET CHUCK.** Introduced less than two years ago, the Jacobs Spindle Nose Lathe Chuck has already gained sensational acceptance. Users who want the very best in machine tool performance are insisting on this chuck — thanks to its many improved features, including advantages never before obtainable in collet equipment. For example, there's the amazing capacity range of its collets, each of which closes through a full  $\frac{1}{8}$ " range without the slightest loss of accuracy or gripping power. And only eleven Jacobs Rubber-Flex Collets are required to chuck bars of any diameter between  $\frac{1}{16}$ " and  $1\frac{3}{8}$ " — assuring exceptional savings over the cost of conventional chuck-and-collet equipment.



**THE JACOBS MANUFACTURING COMPANY  
30 Jacobs Road, West Hartford 10, Connecticut**

**FIRMEST IN GRIP**

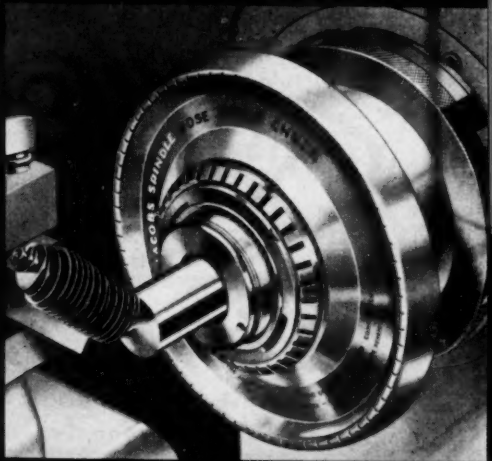


Jacobs Plain Bearing  
Chuck



Jacobs Ball Bearing  
Super Chuck

Jacobs Spindle Nose Lathe Collet Chuck



**IF IT'S A**

**JACOBS**

**IT HOLDS!**



LOWER THE  
BOOM ON COSTS  
**SET RIVETS  
FAST**

2 at a time with the

*Chicago*  
**"214"**

• With every press on the foot pedal the Model 214 Chicago Double Rivet Setter automatically feeds, inserts and clinches *two* rivets. 14-inch throat accommodates large assemblies. Handles  $\frac{3}{64}$ " or smaller steel tubular rivets,  $\frac{3}{4}$ " or less in length. Quick Change Rotary Type Hoppers and Raceways permit a 5-minute changeover to rivets of different size. Adjustable anvils and riveting centers add to its versatility. For help with your specific fastening problem...send a sample of your problem assembly (or a blue print) for free fastening analysis.



**FREE CATALOG** contains valuable engineering information and rivet specifications plus illustrated descriptions of 26 Chicago Automatic Rivet Setters.

*Chicago Rivet & MACHINE CO.*

9610 West Jackson Boulevard, Bellwood (Chicago Suburb) Illinois

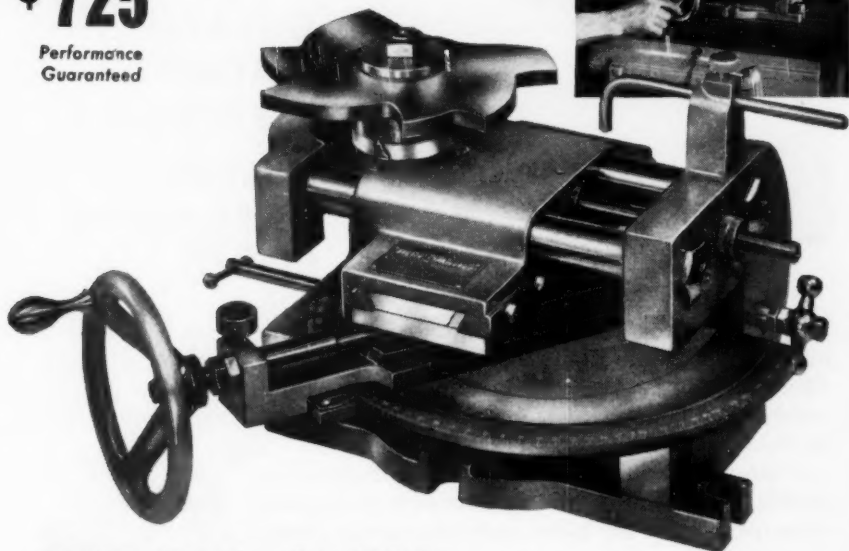
Branch Factory: Tyrone, Pa.



# Helix Master

**\$ 725**

Performance  
Guaranteed



## CUT B&S CAMS *In Your Own Shop*

Why hold up the job waiting for cams? Set up Helix-Master on your milling machine. Cut cams up to 9" dia. easily and accurately. Get greater tool

life and higher speeds with perfect rises. No layouts required. No special skill or experience necessary. Now in use across the country

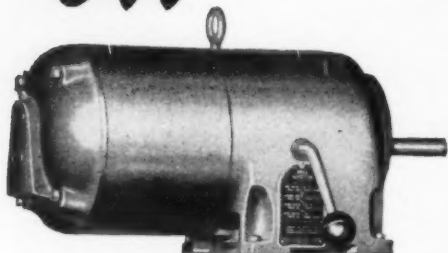
### OTHER SHEFFER PRODUCTS

Master collets  
Master pushers  
Collar tubes  
Pusher tubes and spacers  
Pinch holders

**SHEFFER**  
COLLET COMPANY  
TRAVERSE CITY • MICH.

# LIMA GEARSHIFT DRIVES

## Offer

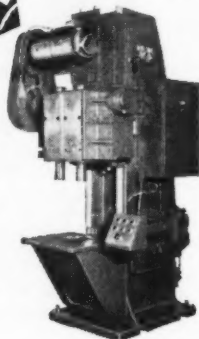


- ★ INCREASED PRODUCTION
- ★ GREATER MACHINE FLEXIBILITY
- ★ LOWER OPERATING COSTS

If production costs are out of balance with selling prices, and cutting into profits, it will pay you to investigate the advantages of LIMA GEARSHIFT DRIVES. Lima Drives will increase production, give greater machine flexibility, and, at lower costs. The end result will reflect in Greater Profits.

LIMA maintains a national Sales Engineering staff to assist you in solving your selective-speed drive problems. Let LIMA recommend the drives you need.

Lima Gearshift Drives are making increased profits for the users of the Moline No. 113FB Hydraulic Rail Feed Machine, built by the Moline Tool Company, Moline, Illinois, and powered by a 7½ HP, Type R4 Lima Gearshift Drive as standard equipment.



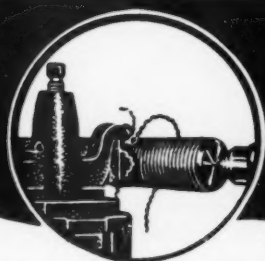
# LIMA



WRITE  
FOR  
BULLETINS



Representation in principal cities  
**THE LIMA ELECTRIC MOTOR COMPANY**  
240 FINDLAY ROAD • LIMA, OHIO



## *Increase YOUR* **HOURLY OUTPUT!**

On **Lathes** and other machines using centers, CMD LUBRICANTS prevent dangerous seizure, waste and costly delays.



On **Die Set Pins and Bushings** CMD LUBRICANTS minimize wear and time-out to re-lubricate.



On **Steady-Rests** CMD LUBRICANTS assure smooth, true turning of work and complete freedom from scoring and seizure.

*Lubricate Machines  
with Longer-Lasting*



*Anti-Scoring*  
**LUBRICANTS**

For smooth performance and greater man-hour production, protect your machines with CMD Anti-Scoring Lubricants. Because they withstand pressures greater than 50,000 pounds per square inch and will not mulsify with liquid coolants, they protect bearing surfaces better and longer. Illustrated here are just a few of the many applications where CMD Lubricants are cutting costs. But see for yourself. Test CMD Lubricants on your toughest operations.

**Write for FREE Samples!**  
**Address Dept. 10-BB**



**CHICAGO MANUFACTURING  
& DISTRIBUTING CO.**

**1928 W. 46th St. • Chicago 9, Ill.**

# Announcing!

## ..... HYDRAULIC OPENSIDE SHAPERS IN



**STROKE LENGTHS NOW AVAILABLE  
36", 48", 60" AND 72"**

**WORK CAPACITY UP TO  
24" HIGH — 38" WIDE**

**0-110 F.P.M. CUTTING SPEEDS  
0-150 F.P.M. RETURN SPEEDS  
HIGHER SPEEDS AVAILABLE**

**AUXILIARIES:  
SIDE HEADS VISES  
AUTOMATIC TOOL LIFTERS**

**HYDRAULIC DRIVE AND FEEDS  
FOR FINE FINISH AND FAST  
DEPENDABLE PRODUCTION**

Hidden costs show themselves only on the balance sheet. A little extra output per machine — slight variations in quality — convenience in processing — these make the difference between a profitable and an uneconomical operation.

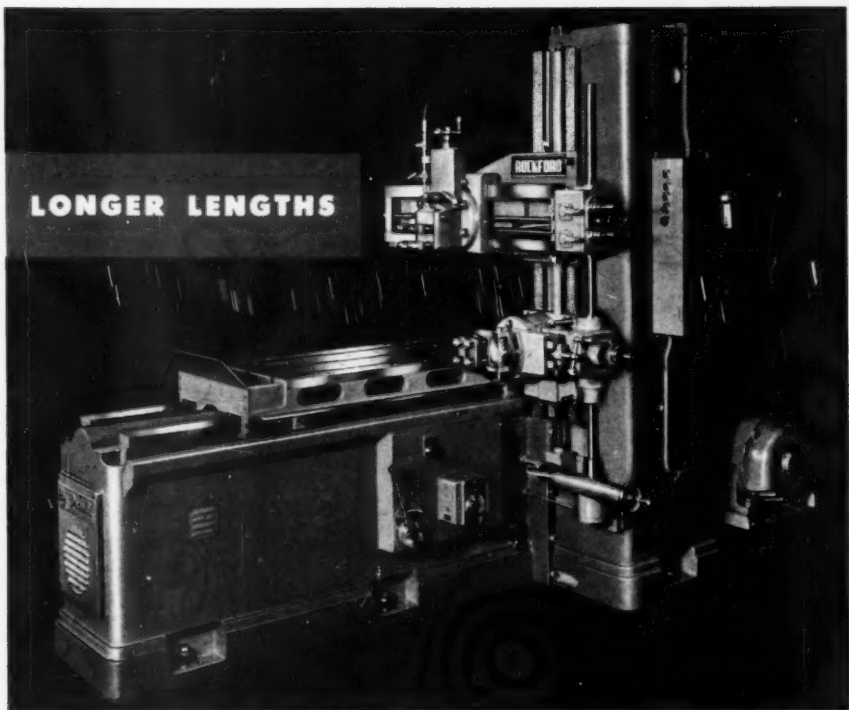
Greatest economy and efficiency result when jobs fit machines. True, many "fringe capacity" pieces are machined satisfactorily either with more machine than needed — or by stretching machines to do the job. But this increases unit costs, hampers output, set-up, handling and quality. It can frequently result in competitive disadvantage.

Check your present *small planing* and *large shaping* operations. These may seem to be satisfactory operations now. But are they economical and efficient when compared with the speed, convenience and capacity of *combining* this range of work on a single openside machine? Do results justify the time and set-up necessary?



**ROCKFORD MACHINE TOOL CO.**

## LONGER LENGTHS



Rockford Openside Shapers adapt a greater range of work in this class, to make it right for the machine. This means the most efficient use of power, feeds and speeds, stroke lengths and size capacity in relation to output and accuracy required. Openside construction allows flexibility to suit size variations. Reciprocation of the work instead of the tool provides planer accuracy; eliminates overhang and reduces wear. Stroke lengths, feed and cutting speeds are adjustable within the range of the machine.

Ask a Rockford representative to show you the advantages of machining large shaper, small planer work on a single Openside Shaper. Present methods will prove inefficient. They can profitably be displaced with Rockford Hydraulic Openside Shapers.



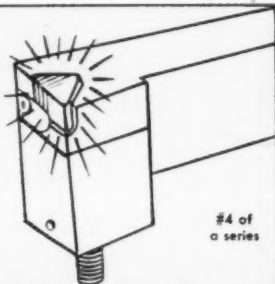
### *Additional Data*

and Specifications are shown in this Condensed Catalog. Send for a copy to use in comparing your present equipment.

**2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS**

# Tool Saving Tips

## USE KENNAMETAL SERVICE AIDS



**KENNAMETAL TOOL MANUAL**

Gives information on proper selection, application, and maintenance. Many useful tables, typical job lay outs, etc. Vest pocket size.



**CLAMPED TOOL MANUAL**

Describes and illustrates how you can make a wide variety of special purpose mechanically-held tools in your own shop. Letter size.



**PERFORMANCE REPORTS**

Contain specific data on tooling and methods used in hundreds of shops to save tools, floor-to-floor time, and grading expense. Letter size.



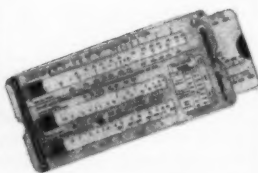
**KENNAMILLING MANUAL**

Illustrates and describes operation and maintenance of various inserted-blade cutters. Contains unique "trouble-shooting" section. Vest pocket size.



**FIELD SERVICE**

Our field engineers offer you the greatest collection of carbide tooling "know how" that is available through any one source.



**KENNAMETAL CALCULATOR**

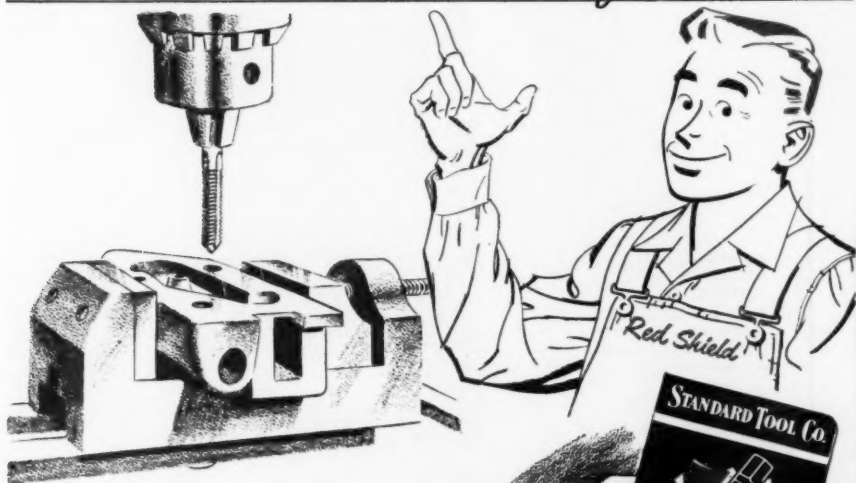
Automatically correlates various factors to give proper speed and feed rates for turning, boring, milling. Eliminates guesswork and calculating. Vest pocket size.

All these service aids are available to you to help you get more work from fewer carbide tools. Ask your nearest Kennametal representative about them, or write to us.

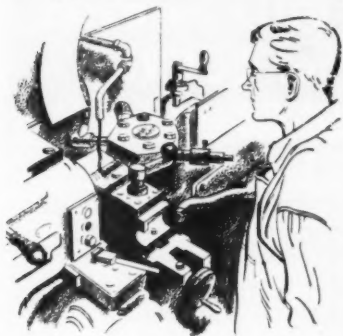
**KENNAMETAL Inc.**, Latrobe, Pa.  
MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES  
AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY



## TAPPING POINTERS.....by Red Shield



**ALUMINUM.** Using 8x32 special gun flute taps. Through holes. We suggested 8x32 commercial-ground, four-fluted machine screw taps with special surface treatment. Cut original tool cost and greatly lengthened life of taps.



**SERVICE.** The local distributor of Standard Tool Co. products will see that you get the help of our Red Shield Service Staff to help on your metal cutting problems. Write for free booklet, "TAPPING DATA".

**ALLOY STEEL.** Using regular cut thread taps on turret lathe. Through holes. We recommended high-speed, commercial-ground spiral point plug taps with special surface treatment. Also showed them how to sharpen taps. Result: 500 to 1000 more pieces per grind.

# STANDARD TOOL CO.

DEPT. 2-G, 3930 CHESTER AVENUE  
CLEVELAND 14, OHIO

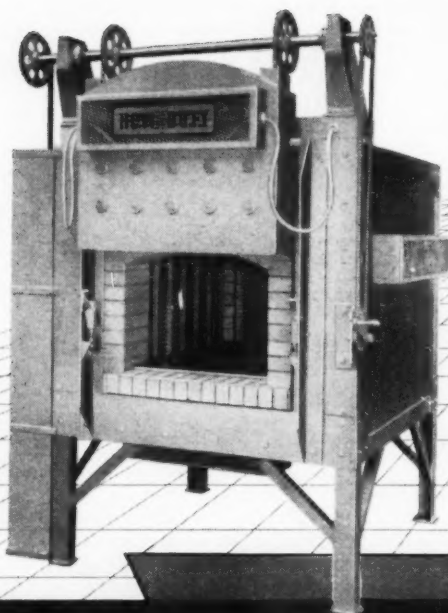
New York • Detroit • Chicago • San Francisco



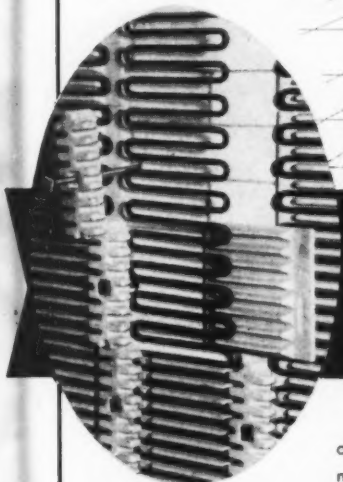
THE STANDARD LINE: Drills • Reamers • Taps • Dies • Milling Cutters • End Mills • Hobs • Counterbores • Special Tools

**ADEQUATE  
HEATING ELEMENT  
SUPPORT**

Radiant plates made of high grade refractories fully support the heating elements.



**It's the RELIABILITY  
of HEVI DUTY Furnaces  
... that COUNTS**



**LONG  
HEATING ELEMENT  
LIFE**

Round rod return-bend heating elements have less surface area to oxidize or deteriorate at elevated temperatures.

**A**DVANCED design, rugged construction and high quality materials are combined with years of furnace building experience to produce Hevi Duty box furnaces. Round rod heating elements and sturdy radiant plate element supports assure continuous performance under severe operating conditions. Users report that reliability and trouble free service are outstanding advantages of Hevi Duty furnaces.

WRITE FOR HEVI DUTY BULLETIN NO. HD441

**HEVI DUTY ELECTRIC COMPANY**

HEAT TREATING FURNACES **HEVI DUTY** ELECTRIC EXCLUSIVELY

DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS

**MILWAUKEE 1, WISCONSIN**



That's right! Simonds "Red End" Hacksaw Blades take less elbow grease . . . cut smooth and easy with less effort. *That's why workers like 'em so much.* And why shouldn't they? You can get "Red End" Blades for any hand job (power jobs, too) . . . made from quality-controlled steel poured in Simonds' own mills . . . and they're made right! So if you want more cutting per blade-dollar, specify "Red End" . . . that's for you. Buy through your Simonds Distributor.

#### THREE TYPES

STANDARD	HIGH SPEED	HIGH SPEED
STEEL	(Molybdenum)	(Tungsten)

*Hard Edge or All Hard*

**A "Right" Blade For Every Job!**

**SIMONDS**  
SAW AND STEEL CO.

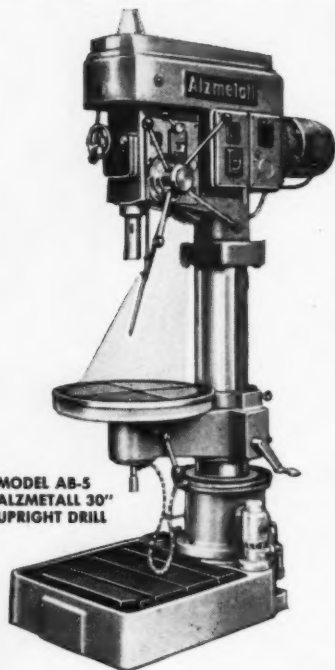
*Branch Offices in Boston, Chicago,  
San Francisco and Portland, Ore.  
Canadian Factory in Montreal, Que.*

# REDUCE DRILLING TIME!

**Get Maximum Cutting Speeds  
with Infinitely Variable  
Speed Control**

The Alzmetall Upright Drills with high powered motor drives and infinitely variable speeds, produce maximum cutting efficiency—even under the heaviest loads. Speed adjustments can be made while the machine is in operation. The regulating hand wheel and speed indicator are conveniently located on the front of the head.

These ruggedly constructed, precisely built drills have an oil pumping system for flooding all gears and bearings, automatic depth releases, built-in lights for work pieces, and, they can be equipped with coolant and tapping attachments. On the larger machines, the coolant tanks are an integral part of the base.



MODEL AB-5  
ALZMETALL 30"  
UPRIGHT DRILL

## SIZES AND CAPACITIES

	MODEL AB-3	MODEL AB-4	MODEL AB-5
CAPACITY	23"	27"	30"
DRILLING CAPACITY—CAST IRON	7/8"	1-3/8"	2-5/16"
DRILLING CAPACITY—STEEL	3/4"	1-1/4"	2"
MAXIMUM DISTANCE—SPINDLE TO BASE	45"	41"	46-7/16"
MAXIMUM DISTANCE—SPINDLE TO TABLE	25"	19"	22-7/16"
INFINITELY VARIABLE SPEEDS R.P.M.	80-3300	90-900	40-800
MOTOR	1 hp.	3.5 hp.	4.2 hp.
SPINDLE—MORSE TAPER	No. 3	No. 4	No. 4
SPINDLE TRAVEL	4-3/4"	7"	9-7/16"
DIAMETER OF COLUMN	4-1/4"	6-5/16"	8-11/16"
NET WEIGHT	440 lbs.	1330 lbs.	3300 lbs.

**FOR MORE INFORMATION ABOUT THESE UPRIGHT DRILLS WRITE FOR CATALOGS**

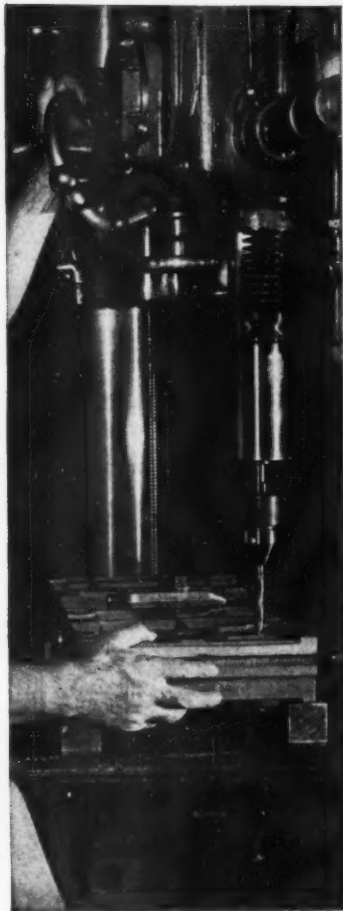
**COSA CORPORATION**  
405 Lexington Ave., New York 17

Your source for all Precision Machine Tools—  
from Small Bench Lathes to Large Boring Mills

IN DETROIT AREA contact DETROIT-COSA CORPORATION, 16923 James Couzens Highway, Detroit 35, Mich.

## "Wahlstrom Automatic Chucks Speed Up Operations"

**says Ford Instrument Company**



"In producing many different-sized through holes, it is important that we change drills rapidly," reports W. E. Sharp, Drilling Department Manager, Ford Instrument Company Division of The Sperry Corporation. "Wahlstrom Fully Automatic Chucks are efficient time and money savers because we can change drill sizes quickly."

With AMF Wahlstrom Fully Automatic Chucks you never stop the spindle to change drills. *Let one spindle do the work of several.* See your local distributor or write to us for Bulletin 56-4.

WAHLSTROM TOOL DIVISION  
AMERICAN MACHINE & FOUNDRY CO.  
5502 Second Avenue, Brooklyn 20, N.Y.

Wahlstrom—only fully automatic drill chuck holding widest range of straight-shank tools—is available in Model A ( $\frac{1}{32}$ " to  $\frac{1}{2}$ " ), Model AA ( $\frac{1}{64}$ " to  $\frac{3}{8}$ " ), Model B for larger straight-shank tools, Model C for taper-shank tools, and fully automatic tappers.

### WAHLSTROM



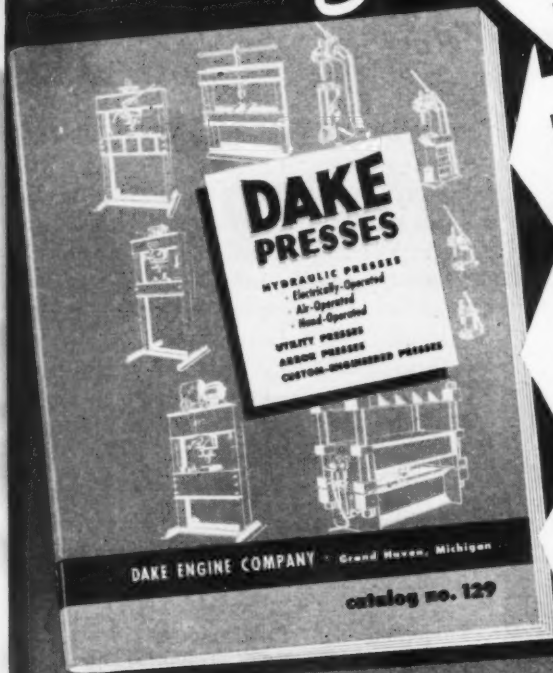
fully automatic  
**CHUCKS**

**NO KEYS, COLLETS OR WRENCHES**

## THE PRESS YOU NEED

is described and  
illustrated in this

# New Catalog



Contains specifications and  
technical data on 40 stand-  
ard models as well as many  
special presses

Fully describes important  
Dake operating and con-  
struction features

Shows attachments avail-  
able for handling a wide  
variety of special jobs

Hand, air, and electric  
presses with capacities  
from 1 to 125 tons

To be sure about your  
new press, see DAKE be-  
fore you buy

**Your copy is waiting  
...send for it**

See us at Detroit  
Booth F-416  
National Metal  
Exposition  
and Congress

**Dake Engine Company, 608 Seventh St., Grand Haven, Mich.**

**DAKE**  
arbor and hydraulic  
**PRESSES**



Single  
Leverage



Compound  
Leverage



Hand-Operated  
Hydraulic



Air-Operated  
Hydraulic



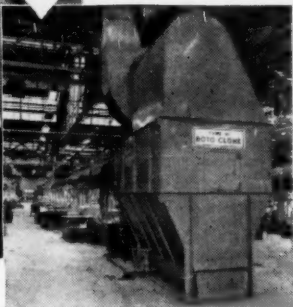
Elec-Draulic



today's best buy is better air!



Type N  
ROTO-CLONES  
exhausting  
grinding and  
buffing  
operations.



## ROTO-CLONES control grinding and buffing dust!

The four Type N ROTO-CLONES\* shown above are only a part of the total number installed in this large automotive parts manufacturing plant to control the difficult dust problem created by grinding and buffing operations.

The Type N ROTO-CLONE is a dynamic precipitator of the hydro-static type. It exhausts, collects and stores dust . . . in the form of sludge . . . within one compact, self-contained unit. High efficiency dust and fume removal is obtained by the Type N's dual washing and scrubbing action. This removes both coarse material and extreme fines from the air stream, even in excessive concentrations. Water curtains induced by air flow eliminate pumps, nozzles and all moving parts.

The Type N ROTO-CLONE maintains peak efficiency without interruptions for reconditioning or service. Also uniform air delivery assures sufficient air flow at hoods and unvarying velocities in branch pipes and main ducts at all times.

The complete line of AAF ROTO-CLONES offers a wide selection of performance and operating characteristics that will efficiently control every dust source. For the correct solution to your dust or air pollution problem call your nearby AAF representative or write direct to us.

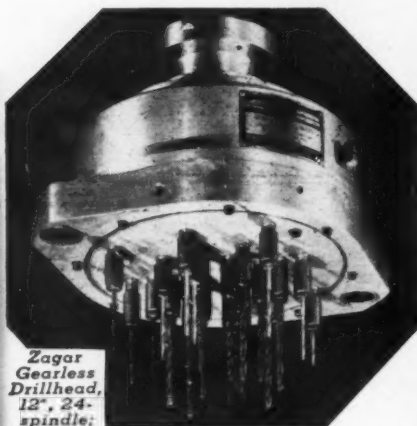
\*ROTO-CLONE is the trade-mark (Reg. U.S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydro-static precipitator types.



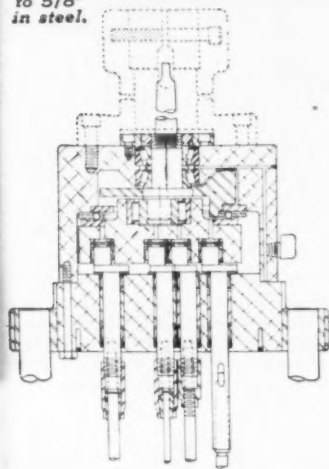
**American Air Filter**  
COMPANY, INC.

312 Central Avenue, Louisville 8, Kentucky • In Canada: Darling Bros., Ltd., Montreal, P. Q.

# ARE YOU HAVING HOLE TROUBLE?



Zagar  
Gearless  
Drillhead,  
12", 24-  
spindle;  
capacity  
to 5/8"  
in steel.



*End  
It*



WITH  
**Zagar**

## GEARLESS DRILLHEADS

Up with production! Down with man-hours! Forget those costly index fixtures! Let Zagar Gearless Drillheads drill your close-center holes, many hundreds of them at one "shot"—any number of spindles—any pattern—any material—as close as twice drill diameter. Zagar Gearless Drillheads are adaptable to any standard drill press or can be designed as complete units. Your part drawing will bring a prompt quotation.

Ask for Catalog B-10.

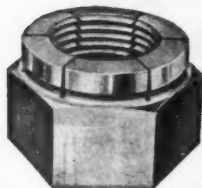
ANY NUMBER OF HOLES—  
ANY PATTERN

**ZAGAR TOOL, INC.**

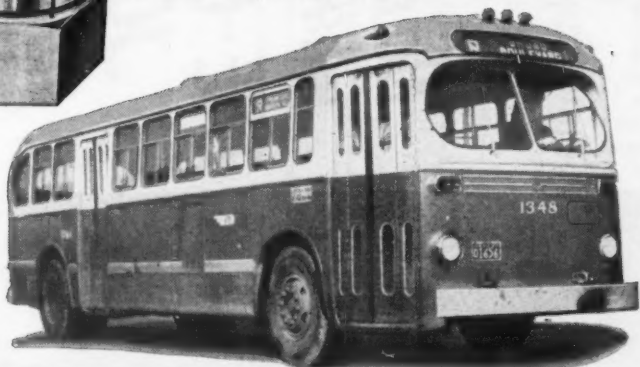
24000 Lakeland Blvd., Cleveland 23, Ohio

**Zagar**

TOOLS FOR INDUSTRY  
and SPECIAL MACHINERY



## SELF-LOCKING NUTS



PTC mechanic Bob Casey tightens Flexloc locknuts used on rear axle flange of PTC bus.

### help PTC to "keep 'em rolling"!

Every day thousands of Philadelphians depend on Philadelphia Transportation Company buses. To "keep 'em rolling", PTC's maintenance must be constant and thorough, since minor failures often cause major breakdowns.

For example, the hex nuts on bus rear axle flanges were being loosened by vibration, despite periodic inspections. Sheared studs resulted. Replacements were expensive, disrupted schedules and loss of riders' goodwill even more so.

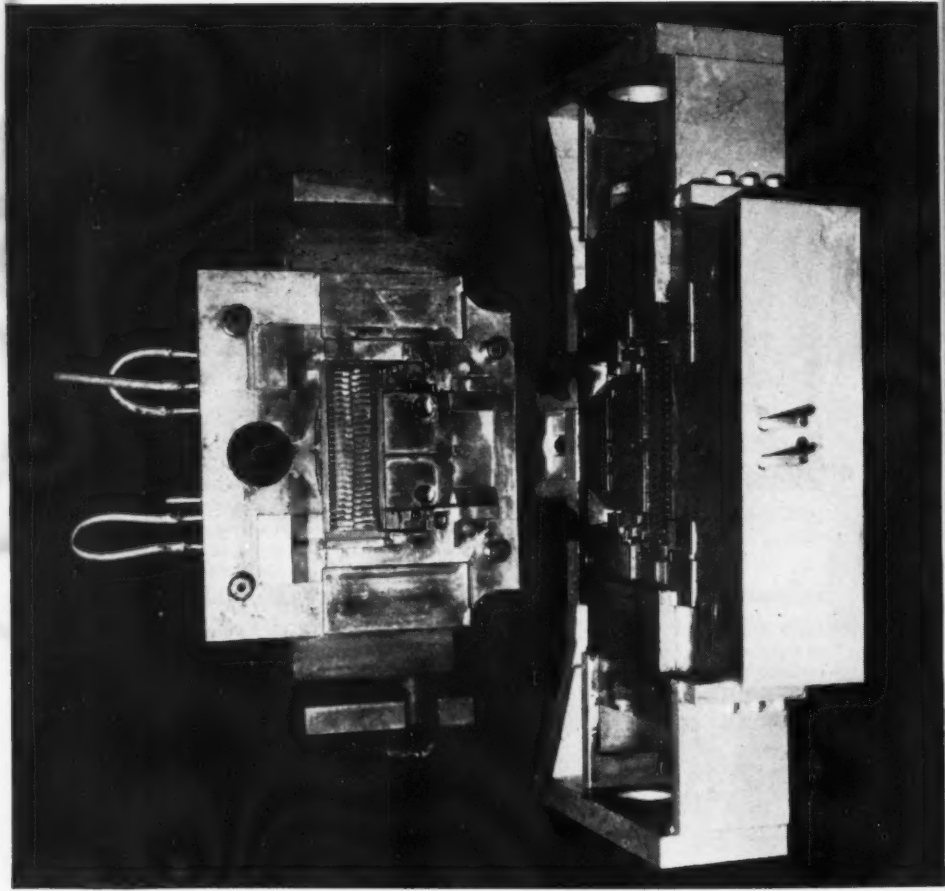
PTC tried FLEXLOC Self-Locking Nuts, found them a simple, economical solution to the problem.

FLEXLOCs stayed *tight*, eliminated shearing of studs. Yet FLEXLOCs were easy to remove when necessary, could be re-used again and again. Furthermore, FLEXLOC dependability reduced the number of maintenance checks needed, effecting additional savings.

If you have to contend with vibration in your business, try FLEXLOC Self-Locking Nuts—free! Just tell us the size, and we'll gladly send samples.

**-SPS- STANDARD PRESSED STEEL CO.**  
JENKINTOWN PENNSYLVANIA

*No matter  
what your  
DIE-CASTING  
JOB  
may be...*



# Accuracy calls for POTOMAC M Hot Work Die Steel

## "HOT- WORK STEELS"

is the title of a new, six-page folder that tells about the chromium, molybdenum, vanadium Hot Die Steel known as POTOMAC M—and also covers other grades for other hot-work operations. Secure your copy—*write today!*

ADDRESS DEPT. MB-21

In the precision casting of aluminum, POTOMAC M Hot-Work Die Steel is especially favored as the material for die-casting dies because its properties help assure accuracy of the steel itself *after* heat treatment. Die makers have found that size changes are held to a minimum. Dimensional stability is thus the *first* contribution that POTOMAC M makes to accuracy.

Production accuracy of the die after it is in service is maintained also by the

resistance of POTOMAC M to wear, to heat checking, and to metal wash.

Allegheny Ludlum makes a complete line of steels for hot-work tooling of various kinds—so, whether your need is the mass producing of duplicate parts or fabricating a few of them, call up or write "A-L" every time for hot-work counsel or service or both. Just tell us your requirements.

• *Allegheny Ludlum Steel Corporation, Henry W. Oliver Bldg., Pittsburgh 22, Pa.*



For complete **MODERN** Tooling, call  
**Allegheny Ludlum**

WARD 3724

# Materials HANDLING EQUIPMENT

CUSTOM BUILT TO MEET  
YOUR NEEDS

Item NS-288  
\$60<sup>75</sup>



## BARREL and BOX GRAB

For picking up any type of wood or steel barrel, box or container, from 40" diameter down to small nail keg size. Will lift up to 2000 lbs.



NS-298  
\$51<sup>15</sup>

## HAND DUMP TRUCK

Reinforced heavy sheet steel. 1/2 cubic yard, capacity—two 8" semi-steel wheels and two 4" metal swivel casters. Wt. 125 lbs.

## UTILITIES RACK ON WHEELS

Item NS-415 M

(Roller bearing, 6" x 2", all metal wheels).

\$67<sup>75</sup>

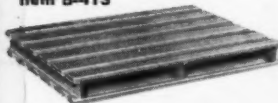
Item

NS-415R (Ball bearing, 8" x 1 1/2", rubber-tired wheels).



\$70<sup>20</sup>

Item B-413



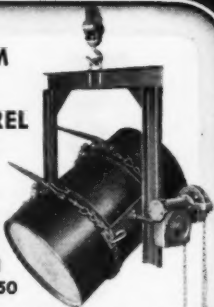
## ALL METAL PALLET

(Double face)

of special rolled steel for extra heavy duty—corrugated and reinforced with 3" channel supports. For power fork truck only.

## DRUM and BARREL TILT

Item B-731  
\$181<sup>50</sup>



A barrel tilt for controlled, precision dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive. Equipped with two safety type locking devices and all steel, welded yoke. Hand-operated chain drive.

## UNIVERSAL GRAB

Item J-631 (1000 lbs)  
\$31<sup>80</sup>

Item J-632 (1 Ton)  
\$39<sup>10</sup>



For picking up heavy boxes, crates, bales or other loads where hooks may be used. Heavy, forged steel hooks adjustable spread of from 16" to 48"

Item S-911M Metal Wheels  
\$36<sup>85</sup>



Item S-911R Molded on Rubber Wheels  
\$42<sup>35</sup>

Item S-911P Pneumatic Rubber Wheels  
\$49<sup>50</sup>

## BARREL TRUCK

It Loads Automatically. Three style wheels metal, rubber or metal and pneumatic. Capacity 1000 lbs. 22" wide for narrow openings. Weight 85 lbs.

TRUCKS—SKID PLATFORMS—  
PALLETS—RACKS—WORK  
TABLES—BOX and BARREL  
GRABS—CART—BOXES—  
STORAGE BINS

We design and build all types of materials handling equipment...for pick-up, loading, moving, dumping or storage...made of metal, or wood, or combination.

When Ordering Always give "item" number; this will help prevent error. All prices are f.o.b. Detroit. Prices are subject to change without notice.

# Palmer Shile Co.

1000 E. WILSON AVENUE  
DETROIT 2, MICHIGAN

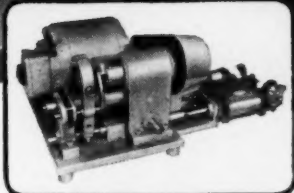


*You can **NOW** speed*  
 deburring, chamfering, pointing,  
 facing, center-drilling, and  
 reaming operations

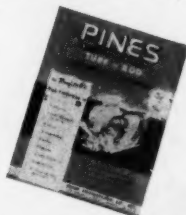


## PINES- END-FINISHING MACHINES

Handle broad range of rod, tube, and pipe end-finishing work with speed and precision. Exclusive chuck feature clamps and feeds work to cutters in one motion. Operator always has one hand free for stock handling. Designed with quick interchangeable tool holders and chuck inserts, 8-speed sheave — 760 to 3920 r.p.m., hardened and ground spindle, grease-sealed precision bearings. Automatic swing-type stock stop assures fast, accurate positioning. Entire unit is portable, takes up small space, handles stock diameters up to 2". Max. feed is 1 1/4". Larger sizes up to 5" capacity available. **Typical production: 800 tube ends per hour.**



(Above) Pines 2" High Production End-Finishing Machine equipped with foot-controlled air operating cylinder. Clamp, feed, and return cycle is automatic. Operator has both hands free for stock handling. Supplied similar to hand-operated unit.



**PINES** ENGINEERING CO., Inc.

*Specialists in Tube Fabricating Equipment*

698 WALNUT • AURORA, ILLINOIS

### Write for Free Bulletin

Write today for free bulletin and learn how these machines are built to save time on a wide range of work.

**EFFICIENT  
ECONOMICAL**

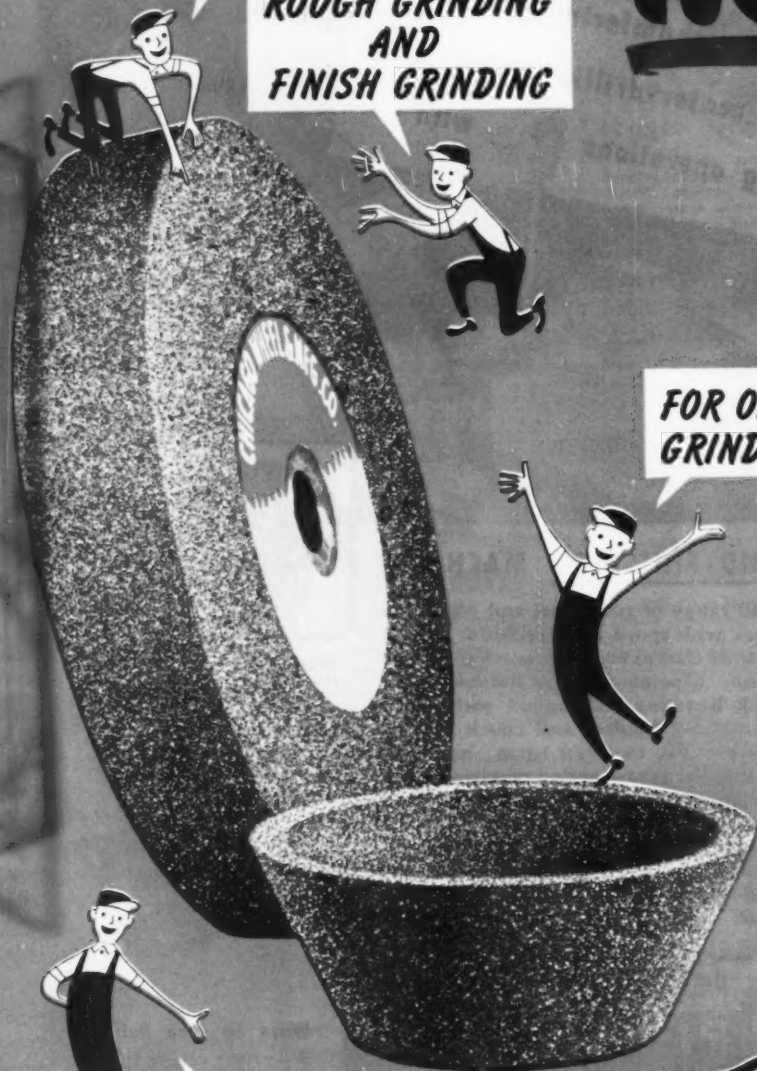
**ROUGH GRINDING  
AND  
FINISH GRINDING**

**New**

**FOR OFFHAND  
GRINDING**

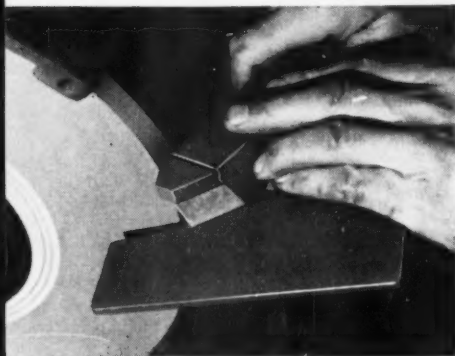
**FOR PRECISION  
GRINDING**

**made  
only by...**



# 'XL' BOND FOR CARBIDE TOOL AND CUTTER GRINDING

**Assures Efficient Performance at Far Lower Cost**



It's really big news . . . this new "XL" Bond! "XL" is the name of Chicago Wheel's remarkable new line of silicon carbide vitrified grinding wheels . . . especially made for carbide tool and cutter grinding.

"XL" wheels come in the most popular tool and cutter sizes and steel backs. They're designed for efficient, economical, rough and finish grinding . . . offhand or precision automatic. And they're already proving themselves on the job, helping to keep the nation's carbide tools and cutters in first-class shape for the mobilization program. "XL" is unexcelled . . . and another 1st for Chicago Wheel!



Chicago Wheel's "XL" Bond is the answer to today's acute shortage of grinding wheels for tool and cutter sharpening. Like all of Chicago Wheel's top-quality abrasive specialties — Mounted Wheels and Cut-off Wheels as well as Grinding Wheels—these "XL" Bond wheels are backed by over half a century of specialized experience. Write today for complete details.

Chicago Wheel & Mfg. Co., Dept. MT  
1101 West Monroe St., Chicago 7, Illinois

Please send us literature and engineering report on the new "XL" Bond Silicon Carbide Grinding Wheels.

Name

Firm

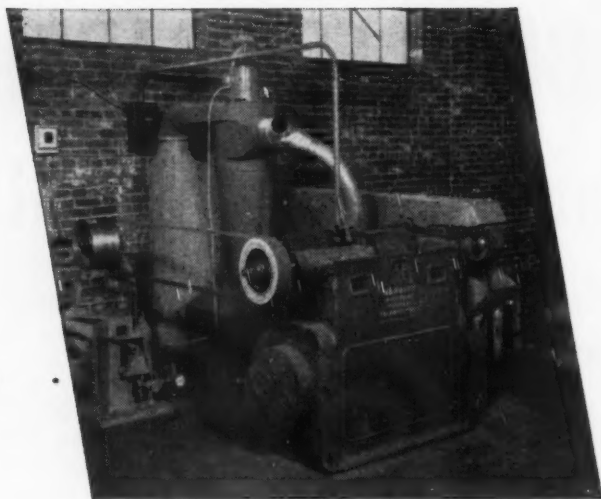
Address

City  Zone  State

**OFFICES IN PRINCIPAL INDUSTRIAL CENTERS**

**CHICAGO WHEEL & MFG. CO.**

1101 West Monroe Street, Chicago 7, Illinois



## Belting Dust for a Quick Knockout with a TORIT DUST SEPARATOR

In the illustration above, the hood and connecting pipe for the left hand abrasive belt have been removed. This has been done to show how this TORIT No. 19-FB Dust Separator fits into otherwise idle space.

**TORIT**



Torit Dust Collectors are available in both cabinet and cyclone types. They range in size from  $\frac{1}{8}$  to 5 H.P. and up to 2,100 cubic feet of air per minute.

Torit dust collecting equipment represents a compact, highly efficient design. It can be tucked into odd corners where it will not interfere with operations or cut off light. An installation like the one above handles large volumes of dust. Working conditions are improved and cleaned air is recirculated to minimize heat losses.

There are TORIT Dust Collectors for every standard dust creating machine, and special adaptations can be quickly fabricated. For details and latest TORIT catalog, write:

**Torit Manufacturing Co.**  
303 Walnut Street St. Paul 2, Minnesota

# CLEVELAND tapping machines

lead  
screw

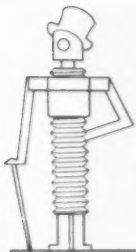
## Check with CLEVELAND First

Do you need to perform any or all of these operations? . . . Tapping . . . Threading . . . Drilling . . . Spot-facing . . . Reaming . . . Chamfering. CLEVELAND engineers can help you with your production problem . . . show you how to effect economies by combining several operations . . . tap groups of holes at one stroke of the machine.

### High Production...Close Tolerances...Increased Profits

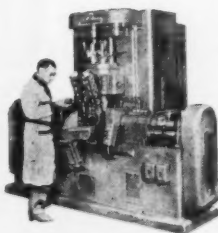
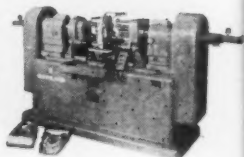
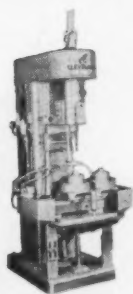
On defense production and on needed civilian jobs CLEVELAND Tappers are reducing cost and saving priceless man hours. With a CLEVELAND machine engineered to the job, a semi-skilled worker becomes a skilled operator.

**CHECK THESE FEATURES...**Precision hardened and ground lead screw • Heat treated alloy steel spindles for maximum strength. • Shear pin protection • Positive coolant and lubricant supply under constant control of operator • Rigidly constructed to give years of service • Maximum safety for operator and machine.

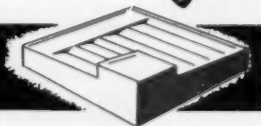


### Mr. Lead Screw says:

Write today for your copy of the Cleveland Production Tapping Guide and a copy of Catalog MB-2.

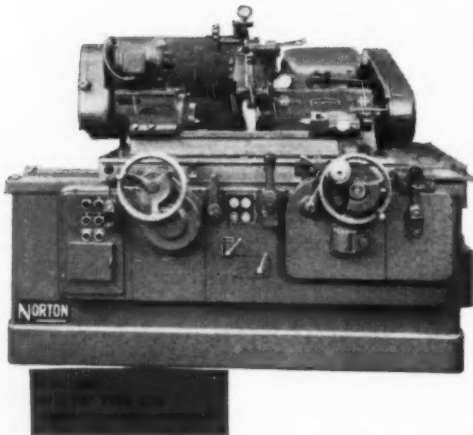


**THE CLEVELAND TAPPING MACHINE CO.**  
A Subsidiary of AUTOMATIC STEEL PRODUCTS, INC.  
CANTON 6, OHIO

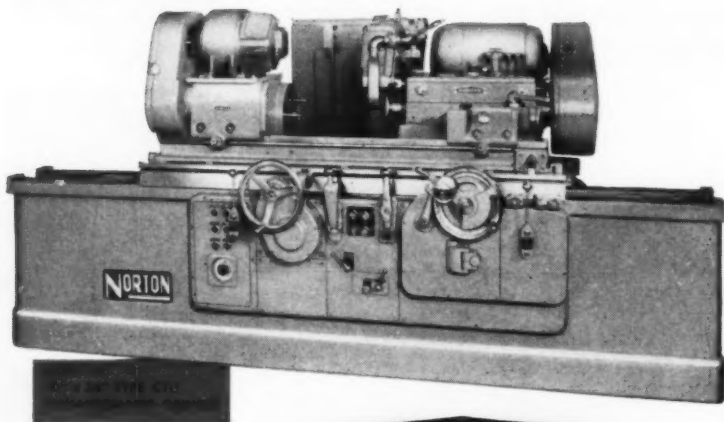


## DO YOU WANT MORE GRINDING PRODUCTION..

**You can make it easier for your operators to produce more with less effort—with NORTON 6" and 10" TYPE CTU SEMIAUTOMATICS**



These Norton Cylindrical Grinders begin paying for themselves right at the start — by easing the operator's job and enabling him to produce more with less effort. With either the 6" or 10" Type CTU machines, he loads the workpiece — touches a lever — and the machine takes over. Work is automatically ground to size under electric timer control, after which the wheel head resets itself ready for the next cycle. The simplicity of this "push-button" control, accompanied by a grinding cycle that is mechanically consistent hour after hour, is designed to put profits into your production.



**NORTON**

GRINDERS and LAPPERS

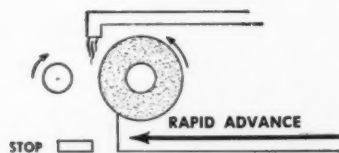
*Making better products to make other products better*



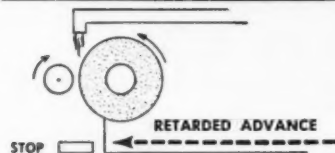
**.. WITH LESS EFFORT?**

**touching one lever**

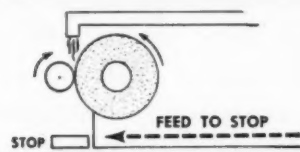
**produces these automatic functions ...**



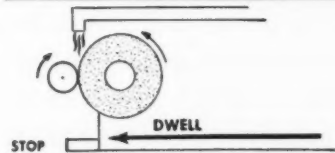
Work rotation starts.  
Coolant flows.  
Wheel advances rapidly.



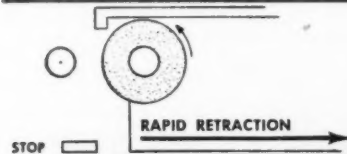
Wheel advance retarded.  
Wheel continues to advance  
at grinding speed.



Grinding continues to  
preset positive stop.



Wheel dwells for size  
and finish.



Wheel retracts rapidly.  
Work rotation stops.  
Coolant shuts off.

M-401 A

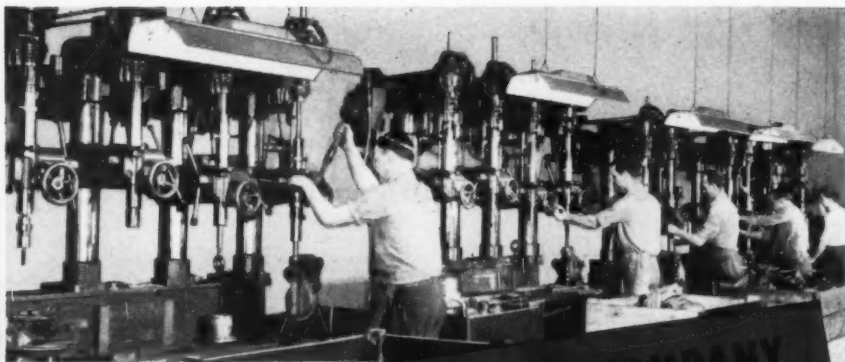
**NORTON COMPANY, WORCESTER 6, MASS., U. S. A.**

District Sales Offices

HARTFORD NEW YORK CLEVELAND CHICAGO DETROIT

October, 1951

57



**HOW THE AMERICAN METER COMPANY**  
*Stepped Up* **REGULATOR OUTPUT**

It takes a lot of accurate drilling, reaming and tapping to produce those high-quality regulators at the Erie Plant of the American Meter Company! Above, you can see how the problem has been handled—with single and multiple spindle “Buffalo” No. 22 Drills. Here a maximum number of operations are performed simultaneously, with minimum set-up time. Note the overall rugged construction (spindle diameter is 1.312”, column diameter is 5.5”). Controls are easily reached. Let these accurate machines solve your drilling problem!



WRITE FOR  
 BULLETIN  
 2989-F

**BUFFALO FORGE COMPANY**

161 Mortimer Street

Buffalo, New York

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING

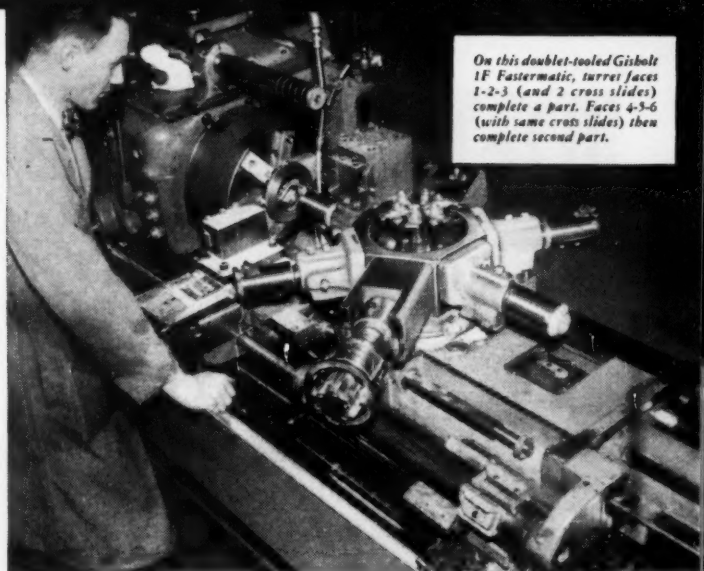
PUNCHING

CUTTING

SHEARING

BENDING

# HOW DUPLICATE TOOLING... AND A FASTERMATIC...



On this double-tooled Gisholt 1F FASTERMATIC, turret faces 1-2-3 (and 2 cross slides) complete a part. Faces 4-5-6 (with same cross slides) then complete second part.

# doubled production!

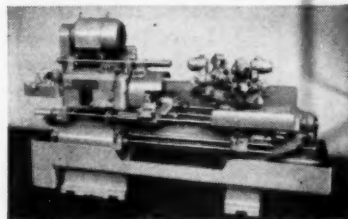
The time and unit cost for machining these cast iron pulley flanges were cut in half when the FASTERMATIC with double tooling took over the job.

Just three turret faces were needed to complete the machining and threading on each part. Therefore, tooling is repeated on the other three turret faces so that two parts are finished with each revolution of the turret. Production is doubled over the old method . . . time lag is cut to a minimum . . . there's twice the time between tool changes.

This smart setup illustrates one of the many ways FASTERMATIC Automatic Turret Lathes give you greater efficiency and lower costs on a broad range of jobs. And one operator can usually handle two or more machines. Ask for the facts.



Floor-to-floor time for these pulley flanges is down to 1.75 minutes. Duplicate tools and collapsing taps on the turret rough and finish the bore, chamfer and cut threads. Front and rear slides shave the angle and form the radius on the O.D.



Gisholt 1F FASTERMATIC Automatic Turret Lathe

**GISHOLT MACHINE COMPANY**  
Madison 10, Wisconsin

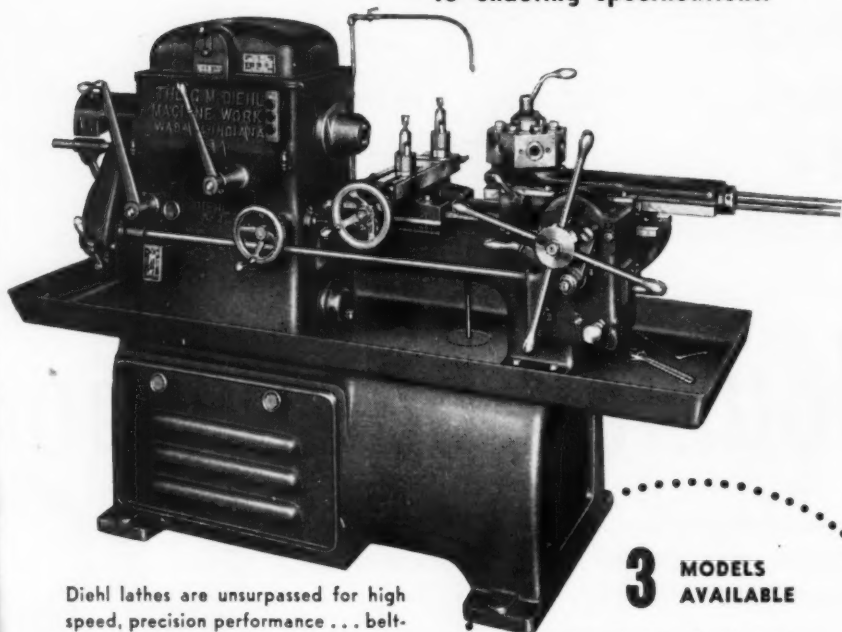


THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

# Diehl <sup>NO</sup> 2 TURRET LATHES

assure accurate, smooth cutting  
to exacting specifications.



Diehl lathes are unsurpassed for high speed, precision performance . . . belt-driven transmission of power to assure smooth, accurate cutting to rigid specifications. Diehl No. 2 Lathes are standard size and use same tooling, including collets, as other standard No. 2 sizes. They give years of economical, vibration-free service with ample power for extreme production requirements.

## 3 MODELS AVAILABLE

- Power Feed to Turret—Screw Feed Cross Slide
- Power Feed to Turret—Lever Feed Cross Slide
- Hand Feed to Turret—Lever Feed Cross Slide

Automatic Chuck  
Capacity (round) . . . . . 1"  
Swing-over cross slide . . . . . 6"  
Swing-over bed . . . . . 14"  
Six speeds . . . . . forward and reverse

● Write for illustrated literature and specifications.

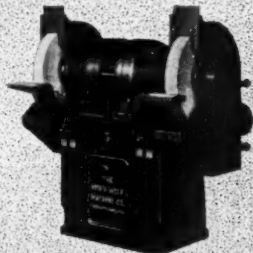
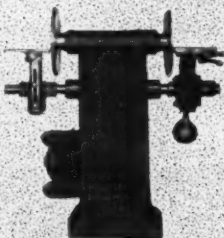
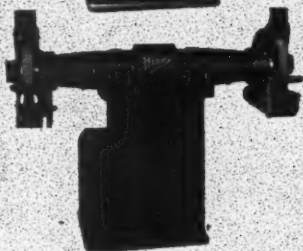
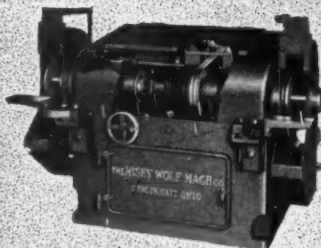
## The G. M. Diehl Machine Works, Inc.

WABASH, INDIANA, U. S. A.



# GRINDERS?

## *Sure! All Kinds*



Wet Grinders and Dry Grinders  
Drill Grinders and Disc Grinders  
Grinders with extra wide  
wheel spacing

Bench Grinders and Pedestal Grinders  
Lathe Grinders and Center Grinders  
Grinders for snagging or tools  
Large Grinders and Small Grinders  
High Speed or Low Speed  
Grinders for production or tool room.

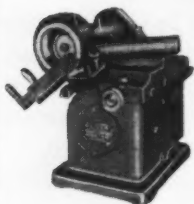
HISEY Catalog No. 71-BK lists more  
than 200 different types and sizes of  
Grinders from  $\frac{1}{4}$  to 25 H.P. capacity.

**Write for it now.**

Also a complete line of Buffing and  
Polishing Machines in direct drive  
and V-Belt drive models.

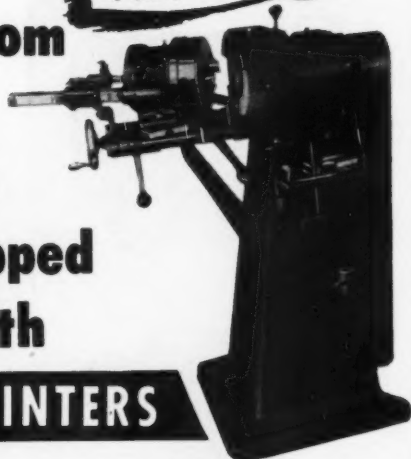
**Hisey** THE HISEY-WOLF MACHINE CO.  
CINCINNATI 8, OHIO  
Division of The Cincinnati Electrical Tool Co.

**You Won't Need  
this →  
For YOUR Tool Room  
IF**



**You're  
Equipped  
With**

**OLIVER DRILL POINTERS**



To maintain production schedules your drills must be kept in proper condition. Machine grinding is generally accepted as the most accurate method for sharpening drills. OLIVER Drill Pointers give balanced cut with each lip doing equal work. It has been established that many production slowdowns due to excessive drill costs and imperfect holes can, in many cases, be traced to improper grinding of the drill points. On the other hand, properly machine ground drills cut faster, last longer and produce more accurate holes.

**LET US PROVE IT** — Send us a few of your drills to sharpen — then check the results on your own production. No obligation.

**Just a Tip**



**Use OLIVER Drill Pointers**

No. 510 for drills  $\frac{1}{4}$ " to 3"—2-3-4 flute. Variable clearances. Variable point angles. Full automatic operation.

No. 21 Oliver Bench Grinder. Hand operated for Drills No. 57 to  $\frac{1}{2}$ ". Right hand, with an improved point. Attachments are available for grinding oil hole drills, left hand and other special points.

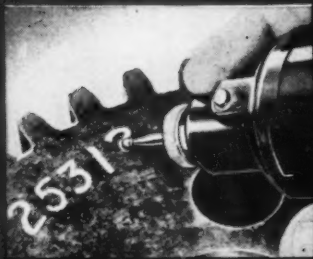
Write for literature that will save you dollars in your tool room.

**OLIVER INSTRUMENT CO.**

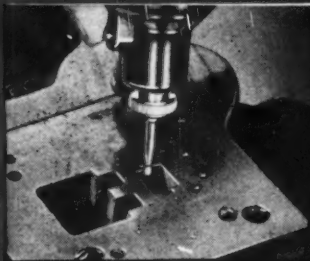
**1408 E. MAUMEE • ADRIAN, MICHIGAN**

AUTOMATIC DRILL GRINDERS  
TOOL & CUTTER GRINDERS—DRILL  
POINT THINNERS—TEMPLATE  
TOOL GRINDERS—FACE MILL  
GRINDERS—DIAMAKING MACHINES

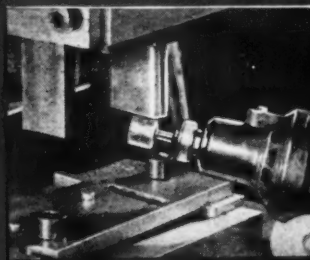




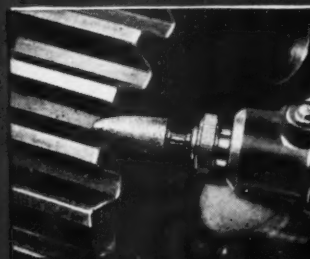
MARKING PARTS



GRINDING DIES



SHARPENING MACHINE TOOLS



BURRING METAL PARTS

**PAYS FOR ITSELF ON  
"HARD-TO-GET-AT" JOBS**

# DREMEL

*Electric*

# MOTO- TOOL



**Approximately  
27,000 R.P.M.**

Dremel Moto-Tools are time-tested — have been widely used in industry for over fifteen years. A veteran of World War II, Moto-Tool served in war plants and at military maintenance bases throughout the world. Thousands of these mighty midgets helped to make the atomic bomb — were used to establish production records in defense industries during the last war. Hundreds of toolroom and production line operations, such as polishing and grinding dies, burring parts, marking tools, sharpening cutters, touch up jobs, etc. are accomplished in seconds, **without tearing down "set-ups."** Moto-Tool is sturdily constructed for long lasting industrial service. Weighs only 13 oz. — dynamically balanced for vibration-less operation.

**MOTO-TOOL KIT NO. 2** contains 23 accessories, including high-speed steel cutters and Model 2 Moto-Tool in natural finish hardwood case .... **\$23.50**

**MOTO-TOOL, No. 2,** with one emery wheel point ..... **\$16.50**

Dremel **HIGH-SPEED STEEL CUTTERS** and balanced wheel points are available for all makes of hand grinding tools. Write for literature.

**WRITE FOR INDUSTRIAL CATALOG**

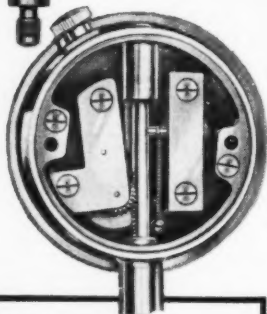
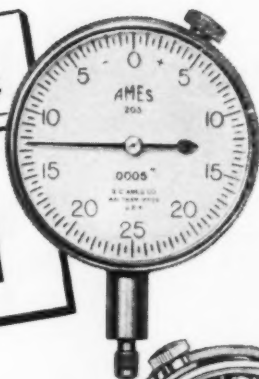


**DREMEL MFG. CO. Dept. 211-K RACINE, WIS. U.S.A.**

# Modern Design SPEEDS PRODUCTION

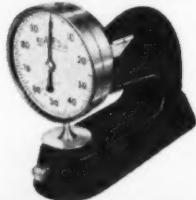
● Ames micrometer dial indicators are the most modern available today — and naturally so because Ames policy for over 50 years has been continually to improve design, to take advantage of new materials and to utilize the most advanced manufacturing methods. They are a real aid to the quality control engineer who is trying to keep pace with today's high production schedules.

Because Ames Indicators are functionally designed, they have fewer parts than ordinary indicators. Construction is simple with functional parts being larger and more rugged and adequately supported. Operational friction is at a minimum. Thus, Ames Indicators combine extreme sensitivity and accuracy with the ability and endurance to stay right on the job longer.



✓ Check this list of features . . .

- 1 Forged Solid Brass Case and Stem
- 2 Heavy Brass Plate
- 3 Coarse Pitch Stainless Steel Rack
- 4 Hardened and Burnished Steel Pivots
- 5 Dials Printed from Steel Engravings
- 6 Patented Bezel Assembly



Representatives in  
principal cities.

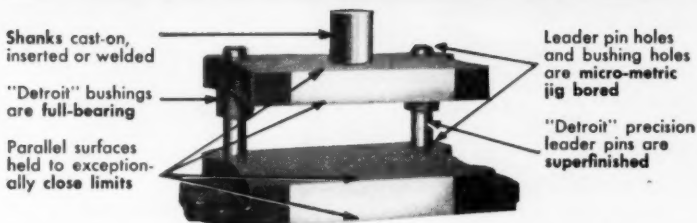
**B. C. AMES CO.** 28 Ames Street  
Waltham 54, Mass.

Mfg. of Micrometer Dial Gauges • Micrometer Dial Indicators

# YOU PAY FOR THE BEST . . . BE SURE YOU GET THE BEST

## FACTORY-BUILT IS BETTER-BUILT

When you specify "Detroit" die sets, you are assured micro-metric precision that means: 1) Lower costs in mounting die in die set and 2) Longer, trouble-free production runs. Factory-built die set! give you what you pay for—parallelism, squareness and finish.



Factory-built to the most exacting standards, "Detroit" die sets are also factory-assembled and factory-inspected. You don't have to re-work "Detroit" die sets in your shop to get the accuracy and performance you have a right to expect.

**For prompt  
factory  
delivery,  
call  
"Detroit"**

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BIRMINGHAM, ALA. . . . .	3-1341	PHILADELPHIA. . . . .	VI 4-4084
BUFFALO . . . . .	PA 9206	PITTSBURGH . . . . .	Perryville 4-5111
CHICAGO. . . . .	PU 5-7694	ROCK ISLAND, ILL. . . . .	R.I. 8-2814
DAYTON . . . . .	HE 3042	ST. LOUIS . . . . .	FR 6811
GLEN RIDGE, N. J. . . . .	GL 2-5658	ST. PAUL . . . . .	CE 1600
INDIANAPOLIS . . . . .	HU 5604	SEATTLE . . . . .	MU 2450
LOS ANGELES . . . . .	AD 7251	TOLEDO . . . . .	MA 4510
MILWAUKEE . . . . .	GL 3-7170	TORONTO, CAN. . . . .	PL 3813
MINNEAPOLIS. . . . .	FR 1822	WICHITA . . . . .	5-8682
MONTREAL, CAN. . . . .	WI 1186	WINDSOR, CAN. . . . .	2-1575

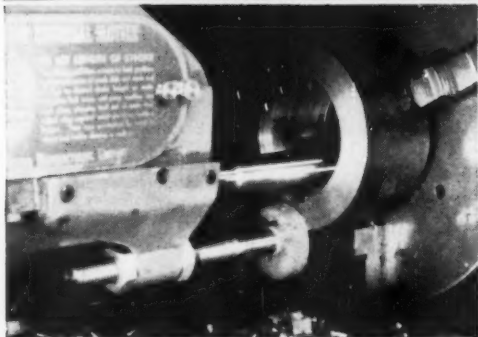
## DETROIT DIE SET CORPORATION

2895 W. GRAND BLVD. • DETROIT 2, MICH.

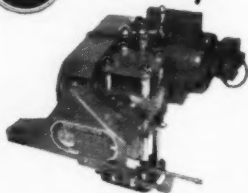


**more  
OPERATIONS**

ON YOUR LATHE, TURRET, OR MILL  
with  
**MASTER MACHINE TOOL  
ATTACHMENTS**



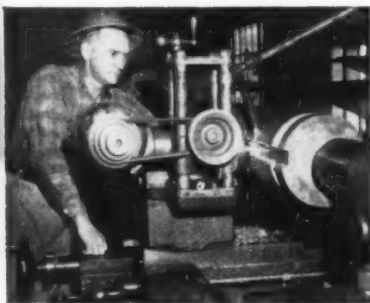
INTERNAL KEYWAY CUTTING WITH  
MASTER SLOTTING HEAD ON A LATHE



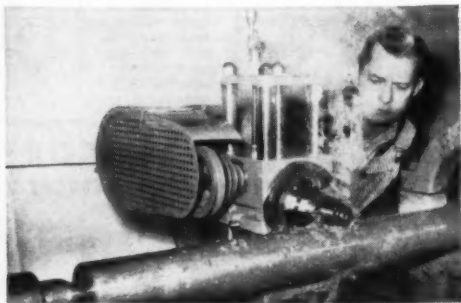
*Master Universal  
Slotting and Keyseating Head*

The multi-purpose Master milling, grinding and keyseating attachments increase the facilities and capacity of your lathes, turrets, or mills, in maintenance shops, tool rooms, as well as production shops. For the cost of one single-purpose machine, you can have several Master units producing on your present equipment.

**THREE SIZES:** Model "C,"  $\frac{1}{3}$  h. p. for 9" to 13"; Model "B,"  $\frac{1}{2}$  or  $\frac{3}{4}$  h. p. for 13" to 18"; Model "M," 1 or  $1\frac{1}{2}$  h. p. for 18" to 72" swing lathes.



END MILLING  $2\frac{1}{2}$ " KEYWAY IN  $9\frac{7}{8}$ "  
SHAFT 22 FT. LONG



$1\frac{1}{2}$  H.P. MODEL "M" ON LATHE MILL-  
ING  $\frac{1}{2}$ " KEYWAY 1 FT. PER MINUTE

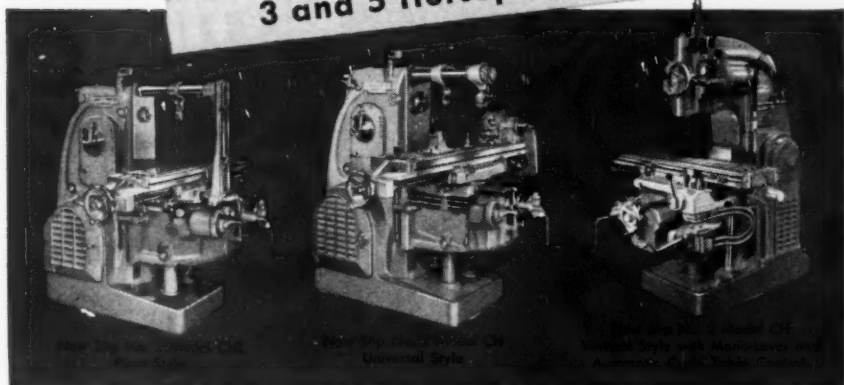
WRITE FOR TWENTY-FOUR PAGE CATALOG

**MASTER MANUFACTURING CO.**  
1310 EAST AVENUE A ■ HUTCHINSON, KANSAS, U. S. A.

KEARNEY & TRECKER ANNOUNCES . . .

# Three new Knee-type Machines

3 and 5 Horsepower



New Kearney & Trecker No. 1 CH, No. 2 CHL and No. 2 CH Milling Machines have every performance-proven operating and construction feature needed for modern short-run or production milling requirements.

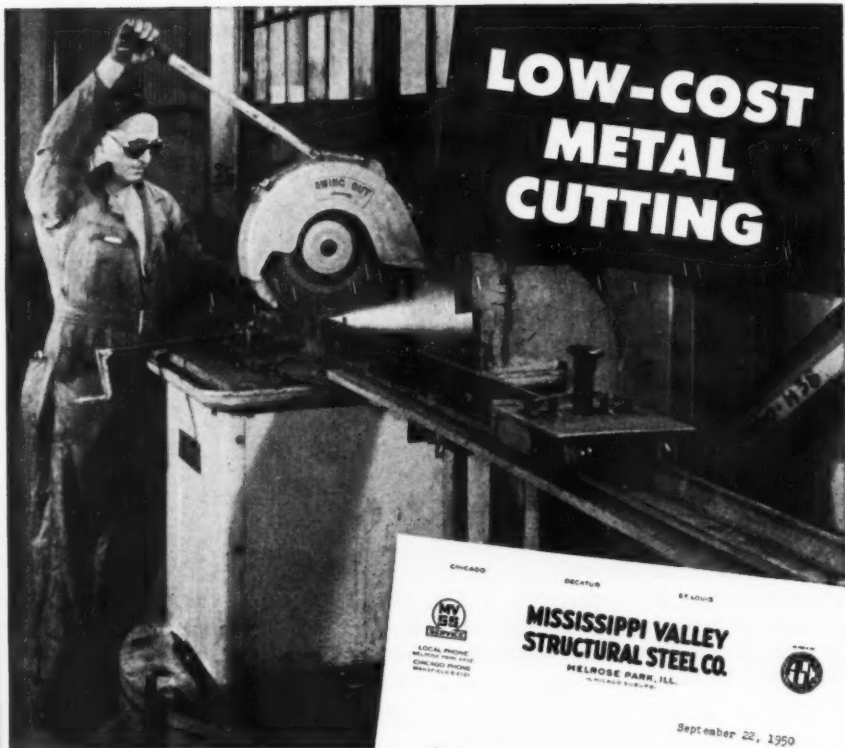
Machine	Working Surface	TABLE		Feeds Number & Range	Power Rapid Traverse — Per Min.	SPINDLE	
		Plain & Universal	Vertical			Nat'l Std. Taper	Speeds — Number and Range
No. 1 Model CH Plain, Universal and (swivel head) Vertical	40" x 10 1/2"	Long. 22"	22"	16—1/32" to 32"	150"	40	16 — 25 to 1500 RPM
		Cross 8"	10"		75"		
		Vert. 17"	16"	16—1/4" to 16"			
No. 2 Model CHL Plain, Universal and (swivel head) Vertical	46" x 10 1/2"	Long. 28"	28"	16—1/32" to 32"	150"	40	16 — 25 to 1500 RPM
		Cross 10"	10"		75"		
		Vert. 17"	16"	16—1/4" to 16"			
No. 2 Model CH Plain, Universal and (sliding head) Vertical	50" x 12"	Long. 28"	28"	16—1/32" to 32"	150"—plain & vert.	50	16 — 25 to 1500 RPM
		Cross 10"	12"		100"—universal		
		Vert. 18"	15"*	16—1/4" to 16"	75"—plain & vert. 50"—universal		

\*Add 4" vertical travel for sliding head

These specifications point up the new larger working ranges of these new machines. You'll find they provide you with new major cost-cutting possibilities for toolroom and production work. Feeds and speeds listed are standard ranges. Optional ranges available.

If you're looking forward to modernizing your tool-room or milling machine line — you can't afford to overlook these new 3 and 5hp knee types. They offer you more practical operating features and heavier construction than any comparable equipment. They're designed to answer today's milling needs — and tomorrow's as well. For complete data on these machines, contact your nearest Kearney & Trecker representative or write direct. Kearney & Trecker Corp., 6784 West National Avenue, Milwaukee 14, Wisconsin.



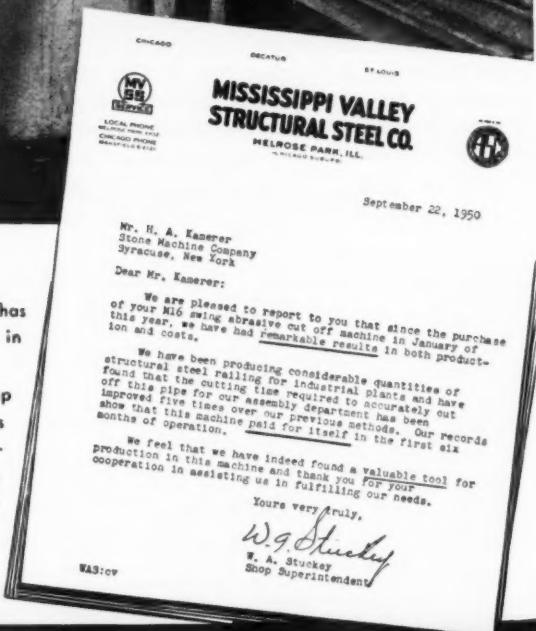


# LOW-COST METAL CUTTING

(Photo Courtesy Mississippi Valley Structural Steel Co.)

This progressive fabricator now has six Stone metal cut-off machines in operation.

The Stone Swing-Cut in your shop will cut metals at the rate of 4 seconds per square inch at a cost of approximately 1 1/3 cents per square inch. You can lower your metal-cutting costs—in ferrous or non-ferrous materials—with a Stone Swing-Cut. Write today for further information.



**STONE MACHINERY CO., INC.**

304 FAYETTE ST.

MANLIUS, NEW YORK



When it  
comes to production—  
come to  
Hartford Special



# Automatic Thread Roller

ROLLS 120 to 150 PCS. PER MIN.

Completely Automatic Feed  
Filtered Lubrication  
Table Top Working Level  
Vibration Free Operation  
Quick, Easy Set-ups  
Class 3 Fits

diam. from .086" to .190"  
thread lengths from 1/4" to 1 1/4"

WRITE FOR BULLETIN NOW!

Subject to prior sale  
**IMMEDIATE  
DELIVERY**  
OF LIMITED NUMBER  
OF MACHINES



**HARTFORD**  
*Special*

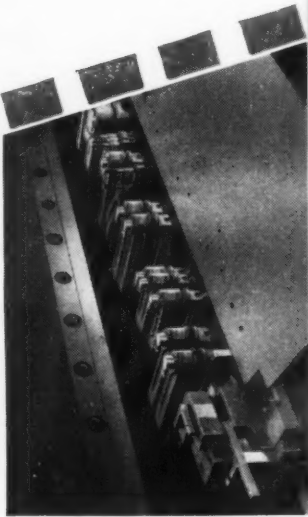
THE HARTFORD SPECIAL MACHINERY CO.  
HARTFORD 12, CONNECTICUT

*Punching  $\frac{1}{8}$ ",  $\frac{1}{4}$ ",  $\frac{1}{2}$ " thick mild steel?*

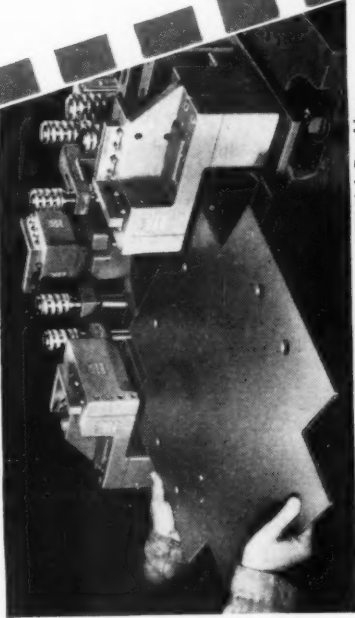
**THERE ARE WALES HOLE PUNCHING  
UNITS TO DO THE JOB  
AND NOTCHING UP TO 1/4" THICK MILD STEEL**

- Only America's most complete line...the Wales Line...can provide the exact *standard* hole punching unit required for any thickness of metal up to  $\frac{1}{2}$ " thick.

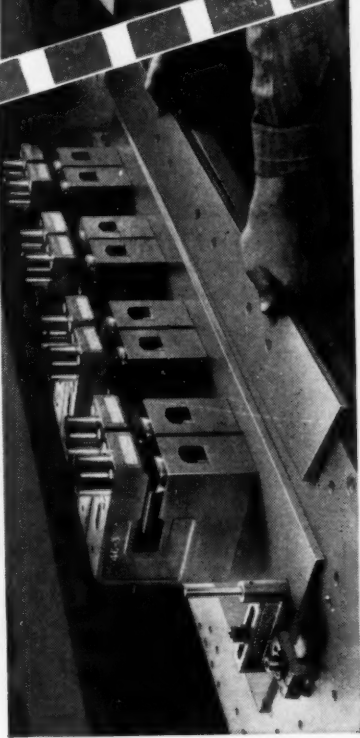
In most applications, hole punching and notching may be accomplished in the same operation on both stamping presses and press brakes. Wales independent, self-contained units which hold the punches and dies in permanent alignment permit set-ups to be made outside the press and placed



Showing Wales Type "DL" Hole Punching and Type "N" Notching Units in a combination press set-up for punching and notching mild steel up to **1/8" THICK**.



A stamping press set-up of Wales Type "CJ" Hole Punching and Type "NJ" Notching Units for punching and notching mild steel up to **1/4" THICK**.



Showing a set-up of Wales Type "CJ" Hole Punching Units in a press brake for punching mild steel up to **1/2" THICK**.

Wales self-contained Units.

The *multiple* time-saving, money-saving advantages of Wales Hole Punching and Notching Equipment is too BIG a story to tell in this space, so write for fully-illustrated, functionally colored catalogs TODAY.

## WALES-STRIPPIT CORPORATION

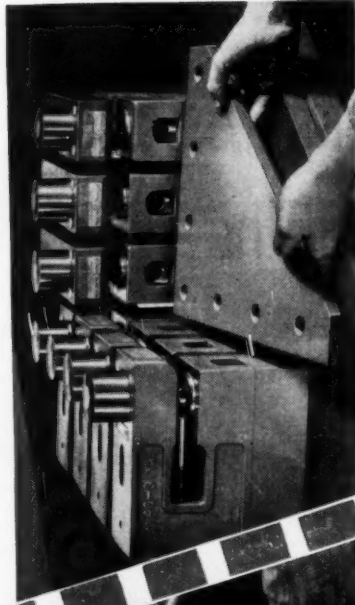
GEORGE F. WALES, *Chairman*

396 PAYNE AVE., N. TONAWANDA, N. Y.

*(Between Buffalo and Niagara Falls)*

WALES-STRIPPIT OF CANADA, LTD., HAMILTON, ONTARIO

**Specialists in Punching and Notching Equipment**



Same Wales Type "G" Units as shown at left in a stamping press set-up for punching mild steel up to **1/2" THICK**.

3 pictures  
tell the  
story...



## **JIFFY PADDED SHIPPING BAGS**

**JIFFY SHIPPING BAGS** are used extensively to ship precision parts and instruments, highly finished or machined parts, accessories, hand and machine tools and similar items.

Three pictures—the 3 basic steps for speedy packing, tell the entire story of the **JIFFY PADDED SHIPPING BAG** for profitable, dependable and speedy shipping.

### **STEP 1 INSERT**

Simply insert into the bag the item to be shipped. No boxes to set up—no fuss—no bother.

### **STEP 2 CLOSE**

Fold over top of bag. Staple or use gummed tape. No strings, fancy closures or special "know-how" needed.

### **STEP 3 TAG**

Affix label and postage. Package is now ready for shipment.

**JIFFY PADDED SHIPPING BAGS** are made from strong moisture-resistant kraft with built-in "expansion" cushioning, which protects shipment from moisture, abrasion, dirt and damage during transit.

**JIFFY PADDED SHIPPING BAGS** are perfect for packing orders in advance, for expected orders and samples. They are ideal for C.O.D. shipments.

Available in 7 standard sizes

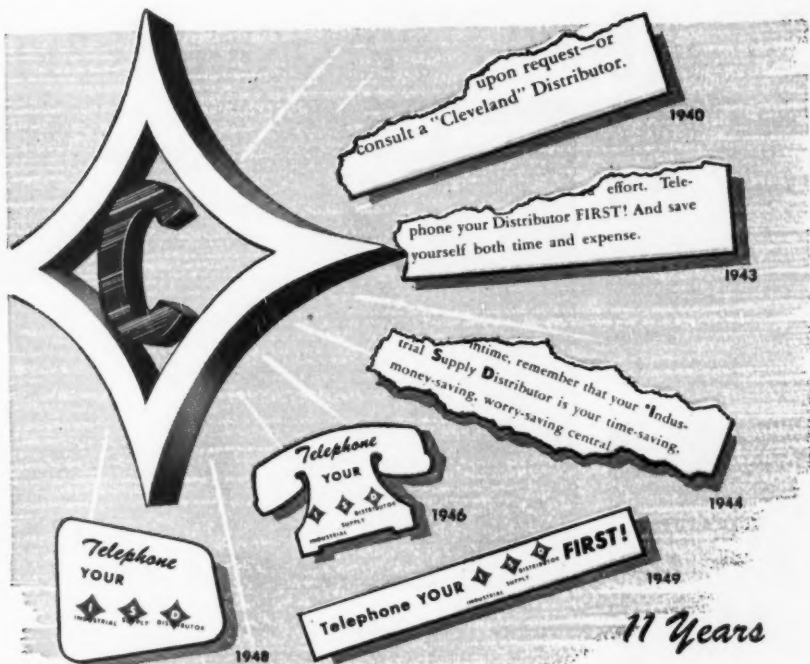
**FREE**  
SAMPLES ON REQUEST




# **JIFFY**

**manufacturing company**

360 FLORENCE AVENUE • HILLSIDE, N. J.



## Telephone Your Industrial Supply Distributor

★ For more than ten years we have been reminding you to "Telephone Your Industrial Supply Distributor" for prompt, dependable service on *Cleveland* Twist Drills, Reamers and other tools bearing the famous  trade mark. The arrangement of the words has been changed from time to time, as illustrated above—but the message always has been the same.

Since 1940 we have been making this suggestion month after month in all of our advertising—and it's just as timely today. Whatever you may require, you will save time and money by calling your Industrial Supply Distributor *first*. Even in the case of hard-to-get items, you'll find that often he is able to speed deliveries. For your Distributor is a favored customer of many factories.

### THE CLEVELAND TWIST DRILL CO.

1242 East 49th Street

Cleveland 14, Ohio

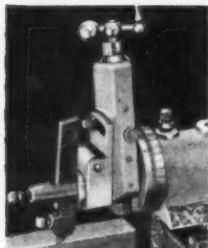
Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 2 • San Francisco 5

Los Angeles 58 • London W. 3, England

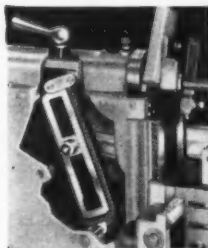
**CLEVELAND**

**DISTRIBUTORS EVERYWHERE Are Ready to Serve You**

# SOUTH BEND 7" PRECISION SHAPER



*Rugged tool head locks in any position.*

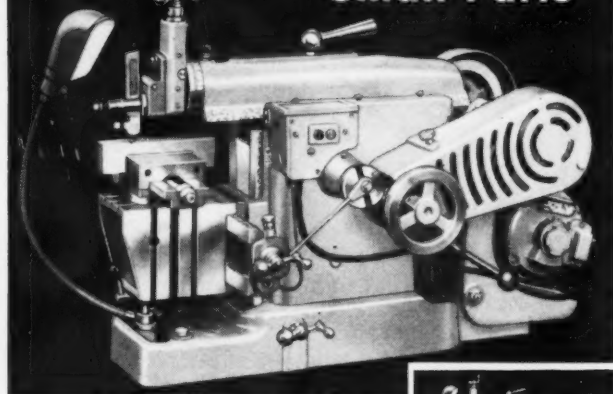


*Graduated eccentric for stroke adjustment.*



*Guards on all belts and pulleys.*

## Cuts Cost of Machining Small Parts



### Saves Time...Saves Labor

It's fast—accurate—easy to operate. This shaper can consistently give you low machining costs on small parts. Its use will release your large shapers for heavier work, save on machine investment, power and maintenance. *Send coupon for literature.*

#### SPECIFICATIONS

**RAM** — Stroke length — 0 to 7". Strokes per minute (4) — 42 to 195.

**TOOL HEAD** — Feed — 3". Rotation — 360°.

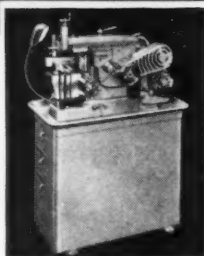
**TABLE** — 9½" horizontal travel, 5" vertical. Power cross-feeds (6) — .002" to .012". Clears ram — ½" to 5½".

**WISE** — Jaw width — 4". Jaw depth — 1". Maximum opening — 4". Swivel base.



### SOUTH BEND LATHE

South Bend 22, Indiana  
Building Better Tools Since 1906



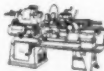
*Steel stand—3 drawers and chip pan.*

The South Bend Machine Tool line also includes 9", 10", 13", 14-1/2", 16" and 16-24" Precision Lathes and 14" Drill Presses, all available in several models.

*Send Information Checked:*

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

☐ 7" PRECISION SHAPER ☐ LATHE ATTACHMENTS



☐ 9" and 10" BENCH LATHES ☐ 10" to 16-24" FLOOR LATHES ☐ 1/2" and 1" collet TURRET LATHES ☐ 14" DRILL PRESSES





## Cuts fast, free, cool...

High production rates and a free, cool cut are outstanding features of V1 Bond Internal Grinding Wheels by CARBORUNDUM. You'll see money saved through excellent form holding qualities which lengthen wheel life through reduced and uniform compensation for wheel wear, requiring fewer machine adjustments during a run. V1 Bond Wheels are being applied effectively to a wide range of internal production grinding. Minimum number of grades required simplifies stocking problems. Many other advantages. See your CARBORUNDUM representative, or write Dept. BB 81-10.

# Only CARBORUNDUM

TRADE MARK

"Carborundum" is a registered trademark  
which indicates manufacture by  
The Carborundum Company, Niagara Falls, N. Y.

**makes ALL Abrasive Products**  
**...to give you the proper ONE**

81-10

# DUSTS ARE DANGEROUS!

## *The Dust King*

### **DUST COLLECTOR**

is a proven means of collecting it.

#### **Easily attached to:**

**Buffing and Polishing Lathes**

**All type grinding machines**

**All machines where dust arises**

Is 47" high and 28" x 33" square.

Delivers 1630 CFM while maintaining 4½" S. P. on two 4½ pipes.

Can handle two large wheels simultaneously.



View showing unit with top lid and front door removed.



Front view of Model A6A Dust King

Contains 2 HP-3 ph. 220-440 v. motor (also delivered with single and 2 ph. motors).

PRICED AT ONLY **\$383.90**  
f.o.b. Chicago

INSTALLATION OF THE

## *Dust King*

IS A GUARANTEED METHOD OF  
DUST CONTROL

*Easily Maintained*

**IT MAY COST MORE BUT IT IS BETTER**

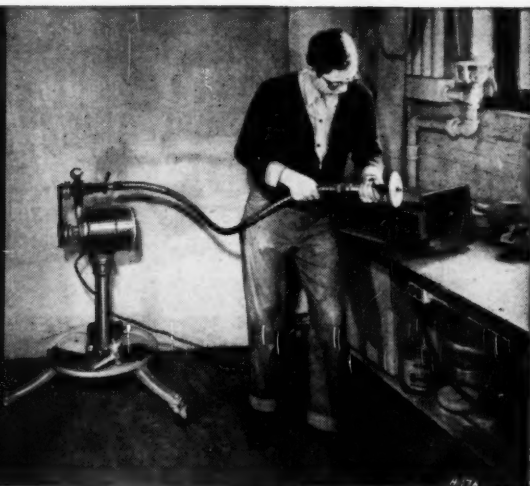
Manufacturers of Dustex portable dust collectors for 10 years

## **DUST FILTER COMPANY**

**134 SOUTH LASALLE STREET**

**CHICAGO 3, ILLINOIS**

**TOUGH  
GRINDING  
JOBS**  
*Can be Easy*



*Pedestal mounted HC5 grinding casting*

Because you only handle a light handpiece, not a heavy motor, Haskins Flexible Shaft Equipment can make fast work of those tough grinding jobs—with surprisingly little in labor cost. For this equipment is capable of delivering the sustained power needed for grinding castings, rough welded joints, sanding large areas or doing heavy scratch brush work.

Haskins has a complete line of attachments, too, for all grinding, sanding, filing or polishing operations . . . there's a unit to meet your specific requirements . . . do the job faster and more economically. Your choice of mounting—bench, pedestal or overhead. Write today for complete details. R. G. Haskins Co., 2645 W. Harrison Street, Chicago 12, Illinois.



**Suspended**



**Bench  
Mounted**



**Pedestal  
Mounted**

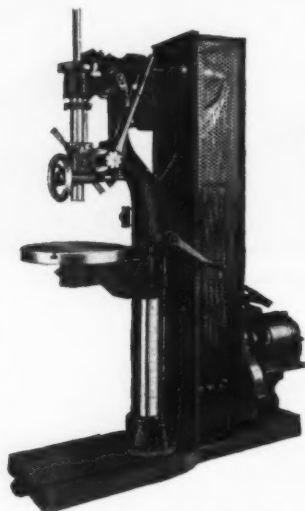
***haskins***  
FLEXIBLE SHAFT EQUIPMENT



# **Royersford**

## **EXCELSIOR**

## **POWER DRIVEN EQUIPMENT**

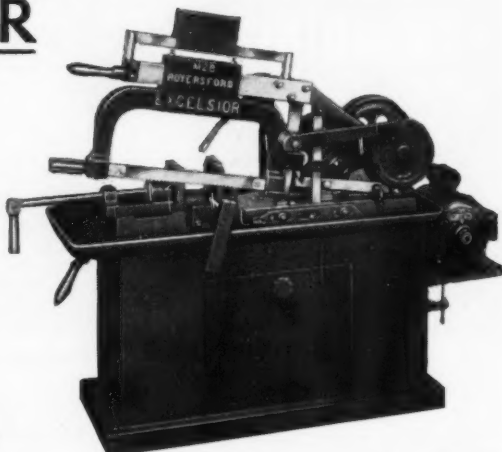


### **21" UPRIGHT POWER DRILL**

Accurate drilling of holes up to 1½". Ball-bearing thrust on top and bottom of spindle. 8 speeds with 3 distinct and complete feeds. Also available with V-Belt instead of gear drive.

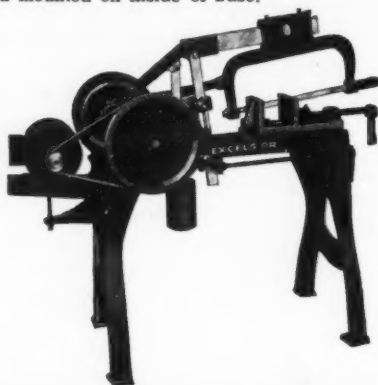
### **M2A HACK SAW MACHINE**

Cutting capacity, 6" x 6". Swivel vise adjustable to 45° angle. Automatic lift, motor driven V-Belt drive. Automatic shut-off, gravity feed. Here's a powerful hack saw which is rigidly constructed and reduces costs in hundreds of plants. Send today for informative literature on ROYERSFORD equipment. No obligation.



### **M2B WET CUT HACK SAW—6"x6" CAP.**

Provides low cost, efficient cutting operation. Requires floor space of only 21" x 54". Motor driven, V-Belt drive, 3 Speeds, Gravity feed. Swivel vise cutting to 45° angle and interchangeable. Coolant pump operated by cam and mounted on inside of base.



**Royersford**

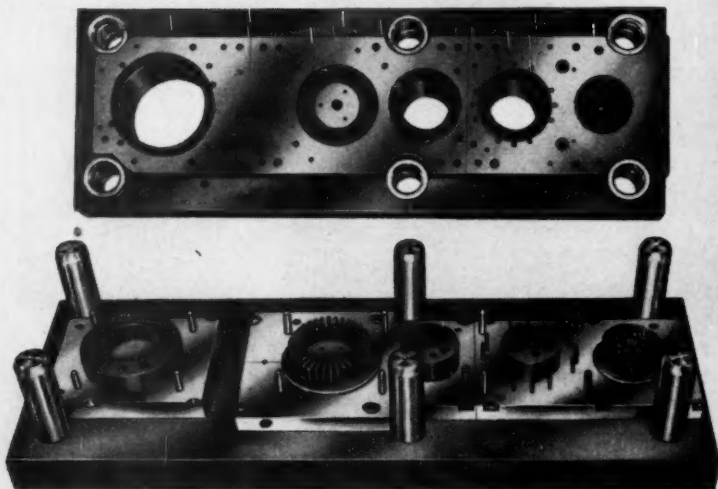
**FOUNDRY & MACHINE CO.**

BOX B. ROYERSFORD, PA.

# HARIG PRECISION

# CARBIDE DIES

Cut Production Costs



ANIMATION  
DIES  
BLANKING  
DIES  
DRAW  
DIES  
PROGRESSIVE  
DIES  
JGS  
FIXTURES  
MOLDING  
DIES



Proven - Longer Die Life

Proven - Less Down Time

Proven - Greater  
Production

Proven - Lower Cost  
Per Piece

*Your Inquiries Invited.*

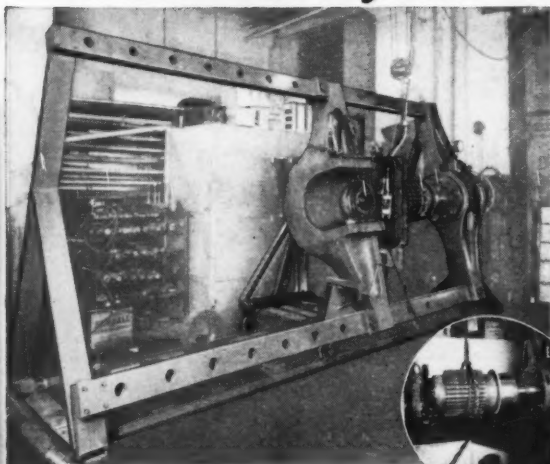
# HARIG

MANUFACTURING CORPORATION

323 NORTH ALBANY AVE., CHICAGO 12, ILL.

**For Fast, Efficient Pressing,  
Bending, Forming, Straightening . . .**

# **New Rodgers FORCING PRESSES**



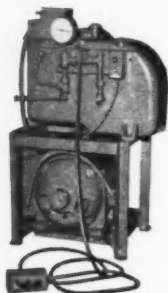
Rodgers 300 Ton, 75° Inclined, Stationary Forcing Press, one of many in the complete Rodgers line. In the application shown, the press is being used efficiently to press an armature shaft.

## **. . . With These Features of Construction and Operation**

**SEPARATE PUMPING UNITS**—Choose from individual hand-operated or power-driven pumps to operate any model Rodgers Forcing Press. **REMOTE CONTROL OF POWER PUMPS**—Operator can control press from any desired position. **REMOVABLE HYDRAULIC CYLINDER**—Cylinder is easily removed from head member to permit servicing or use for other power applications. **INDIVIDUAL FRAME UNITS**—Tracks, tension bars, abutment member and head member are all separate units to facilitate handling and erection of press. **EXPERTLY ENGINEERED AND CONSTRUCTED**—All units of Rodgers Forcing Presses are made strong, durable and dependable to give years of reliable service.

## **. . . In These Types and Sizes**

Rodgers Versatile Forcing Presses are available in portable or stationary models—horizontal, vertical, 75° or 90° inclined—100 to 600 tons—with hand-operated or power-driven pumps. In this broad selection, you'll find the ideal press to meet your requirements.



## **Separate Power Pump**

Select your press operating unit from hand-driven pumps or power-driven pumps. Shown is a Rodgers 2-cylinder Power Pump with remote control.

## **Send for New Catalog**

For full details and specifications on the complete line of Rodgers Forcing Presses send for Catalog 315.



# **Rodgers Hydraulic, Inc.**

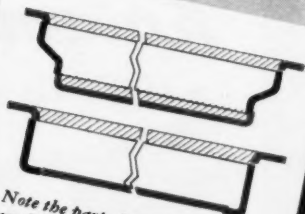
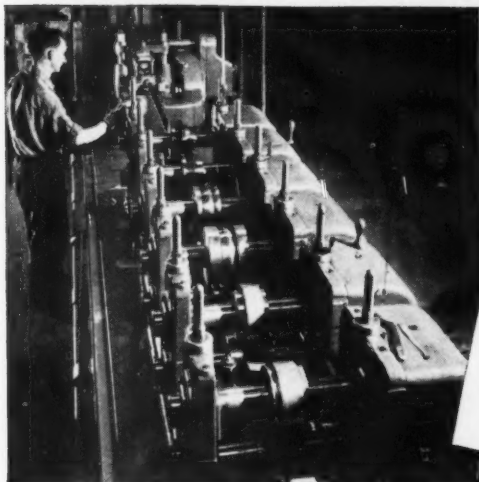
7453 Walker St., St. Louis Park, Minneapolis 16, Minn.

**HYDRAULIC POWER EQUIPMENT**



# 12 EXAMPLES OF ECONOMIES

effected by combining different operations in a  
YODER Roll Forming Machine



*Note the part of two hat shapes, used in making baffle rings for jet engines, shown in black. The remainder, shown in color, represents scrap. By cold roll forming only the profiles used, bending and welding into rings, the excessive scrap loss of nearly 80% is avoided.*

## No. 12. Up to 80% saving in material cost by cold-roll forming, avoiding former heavy scrap loss

Of all the methods available for cold-shaping flat rolled metal, the cold roll forming machine offers the highest production per man hour and the lowest conversion cost. It is often a good investment even when operated only a few days per month.

Of still greater importance than conversion cost is often the saving of weight which may be effected by designing light, strong box, tubular and other special structurals to take the place of hot rolled angles, channels, trees, etc. Material savings up to 50% are frequently made.

In press forming of hat shapes to make stator rings for jet engines, up to 80% of the metal has to be cut away and discarded

in order to obtain one ring. By cold roll forming the profile from strip, cutting to length, bending into rings and joining ends by welding, this huge scrap loss is avoided. Here is another example of how a Yoder cold Roll Forming production line may save scarce and expensive stainless steel, aluminum, brass and other metals. In such cases, the material savings alone may be many times greater than the conversion cost, even for relatively small quantities.

Function, scope, and economics as well as mechanics of cold roll forming, are discussed in Yoder's 86-page illustrated book which will be sent on request. Recommendations and estimates for the asking,

**THE YODER COMPANY • 5509 Walworth Ave., Cleveland 2, Ohio**

### Complete Production Lines

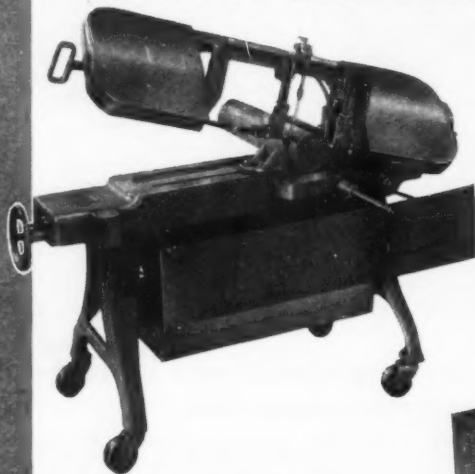
- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding



# WHAT METAL CUTTING CAPACITY DO YOU NEED?

## *Kalamazoo* BAND SAWS

3 SIZES TO MEET YOUR REQUIREMENTS



Intermittant or continuous production cutting model—medium, large, or extra big capacity—you name it, Kalamazoo has it! 3 sizes in both standard and coolant models—a saw for every need.

On the left, the Kalamazoo 816-C (coolant model) takes up to 8" rounds, tubes, pipe; up to 8" x 16" bars and angles. Cuts them fast, smooth, accurately—with no burr, minimum kerf. Also available as Kalamazoo 824 standard or coolant models with 8" round capacity and 8" x 24" flat capacity.

On the right, Kalamazoo Model 610-S—fast, rugged, and accurate, with a host of exclusive features for finer performance. Takes rounds, tubes, and pipe up to 6" diameter, bars and angles up to 6" x 10". Outstanding low-cost saw on the market. Uses any standard motor  $\frac{1}{3}$  HP, 110/60/1. Same capacity with coolant equipment as Model 610-C. Write today for complete information on any model.



MACHINE TOOL DIV. *Kalamazoo* TANK and SILO CO.

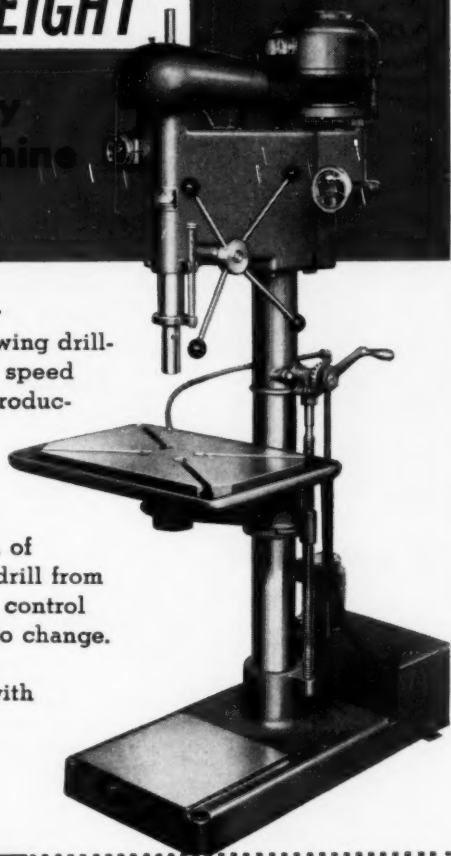
821 HARRISON ST., KALAMAZOO, MICHIGAN

# BIG SWING- MEDIUM WEIGHT

a revolutionary  
new Drilling Machine

Sibley E-25

Not too light, not too heavy—weighing 765 lbs., this 25" swing drill-ing machine has the required speed and power for high volume produc-tion. Accuracy of large table with coolant trough is maintained to .0007" in six inch radius. The variable speed drive permits selection of the exact speed for any size drill from 1/8" to 1". Convenient speed control is self-locking with no belts to change. Tachometer permits accurate reading of speeds. Powered with a 1-1/2 H.P. Axial Air Gap Motor. 5 spindle speed options.



## SIBLEY

MACHINE & FOUNDRY CORP.  
17 EAST TOTT STREET  
SOUTH BEND 23, INDIANA

SIBLEY MACHINE & FOUNDRY CORP.  
77 E. Tutt St., South Bend 23, Indiana  
Send Catalog No. 69, Free!

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

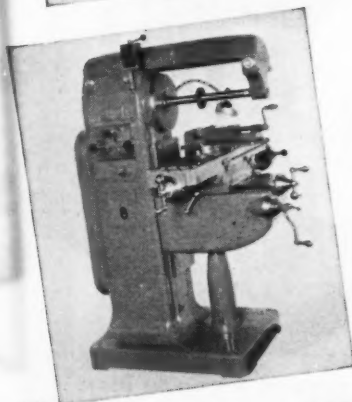
**MAKE  
INDEX**  
*Your Choice*

*Get a Head Start on Production*  
**with these RUGGED, VERSATILE,  
EXTRA CAPACITY  
MILLING MACHINES**



Whether it be the heaviest jobs or light production, you will find these improved, low-cost machines ideal for the purpose. They offer speed and precision to meet present-day stepped-up schedules, while assuring a substantial saving in time and labor. Get details about their many advantages now.

**Model 55 IMPROVED VERTICAL MILL.** A speed range of 80 to 2700 RPM's combines with a 1 H.P. drive, 3¼" quill, and extra rugged spindle mounted on over-size precision ball bearings to give a capacity of ½" to 1½" end mills in steel. Spindle quill travel is 5¼" either by lever, hand wheel, or power, and has adjustable positive stop and automatic safety throw-out. Table 40" x 9" or larger. Longitudinal table power feed has 8 geared feed changes.



**Model 60 PLAIN HORIZONTAL MILL.** A full No. 1, that in many ways equals or exceeds a light No. 2 in capacity. Low maintenance due to all rapid moving parts running in oil, hardened alloy gear train, and fully ground alloy steel spindle mounted on pre-loaded precision ball bearings requiring no adjustment. Standard table 40" x 9" overall, with larger table optional, is supported by 18" of saddle bearing, and has accurately ground lead screws for transverse and longitudinal movement. Constant flow coolant system of 8 gallon capacity starts and stops with spindle.

*Write for Literature*

# **INDEX MACHINE Co.**

540 N. MECHANIC STREET

JACKSON, MICHIGAN

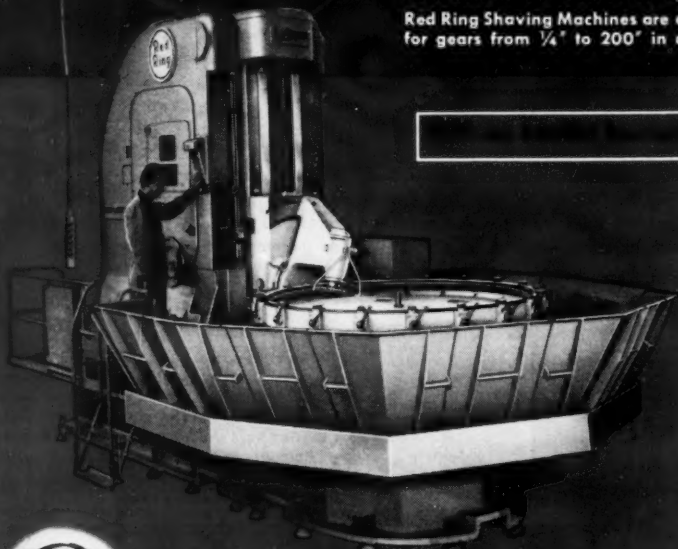
ANOTHER  
RED RING  
"First"

## 100" Gear Shaving Machine

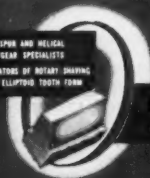
The first gear shaving machine of its type ever built is the new Red Ring Model GCT which shaves both internal and external spur and helical gears with pitch diameters up to 100" and face widths up to 40". It is especially applicable to the large gears used in tanks, power shovels, mine hoists, speed reducers, stationary prime movers and marine drive units.

Outstanding characteristics of this machine are its high degree of accuracy in shaving large gears, its ingenious aids to rapid loading and unloading and the ease with which it can be set up.

Red Ring Shaving Machines are available for gears from  $\frac{1}{4}$ " to 200" in diameter.



SPUR AND HELICAL  
GEAR SPECIALISTS  
ORIGINATORS OF ROTARY SHAVING  
AND ELLIPTICAL TOOTH FORM

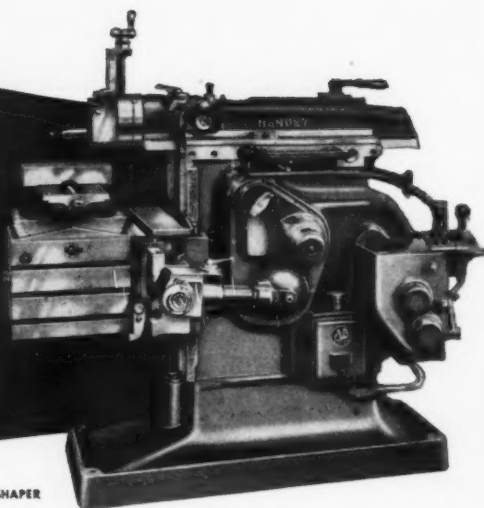


**NATIONAL BROACH & MACHINE CO.**

3800 ST. JEAN . . . . . DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

...If you are not  
using **Modern  
Hendey Machines**  
you are not  
earning the  
profits that  
you should!

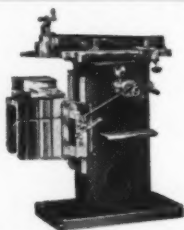


**1951**

12" UNIVERSAL CRANK SHAPER

A comparison of the old Hendey Friction Shaper with the NEW Hendey 12" Universal Crank Shaper will instantly reveal the profit possibilities that you may be missing. The modern Hendey Shaper offers the most complete, up-to-date shaper available today. Full standard equipment means that there are no "extras" to buy. This equipment includes table and vise for positioning and indexing work to any angle—

flanged mounted motor—mechanical controls on both sides—fully automatic lubrication—quick change swivel head—adjustable, preloaded Timken bearings on the bull gear. The 12" Hendey covers a range which makes it ideal for tool room and production work. Hendey Shapers are also available with capacities from 16" to 28", both standard and heavy duty. Write for full details on the modern Hendey Shapers.



1920

Still using old 15" Hendey friction drive shapers? They have only 2 speeds, 21 and 30½ strokes per min., as against 8 speeds from 14–200 for the new 12" shaper. Surveys prove that the new 12" Universal High Speed Crank Shaper covers a majority of all jobs in most plants. Mechanical changes are almost too numerous to mention—improved accuracy, speed and profits on the new 12" shaper will easily convince you of the advisability of changing now!

✓ Continuous, advanced engineering by Hendey is worth watching—and must be watched if you are to earn full profits from your lathes and shapers. For complete particulars and prices, contact your nearest Hendey office.

**MODERN**  
*Hendey*

THE HENDEY MACHINE COMPANY  
MAIN OFFICE & PLANT TORRINGTON, CONN.  
BRANCH OFFICES New York, Chicago, Boston, Detroit,  
Rochester, Los Angeles, San Francisco  
REPRESENTATIVES: Philadelphia, Cleveland, Pittsburgh



# How wide a tolerance can an air gage check?



Right: Triple Dial CompAIRator simultaneously checking three dimensions of asbestos cylinders with tolerances of .120".

**Up to 120 Thousandths . . .**

*if it's a Taft-Peirce CompAIRator.*

*No other gage combines the range, speed, and economy of these versatile T-P gages.*



Left: Standard CompAIRator unit with special plug to check clearance for packing rings in bearing housings of steam turbines. Tolerances  $\pm .020$ ".

NOTE: The same standard Taft-Peirce CompAIRator used when tolerances are as narrow as .000050" can be used for tolerances up to .120"

Complex measurements, such as checks on taper, concentricity, center distances, and squareness of bore to

face, are easily made with this simple design.

Internal diameters as small as .058" can be checked completely. Tapers can be read

directly with a single pointer on a single dial! Contact your local Taft-Peirce representative for the full facts — or write for Catalog 610.

THE TAFT-PEIRCE MANUFACTURING COMPANY  
WOONSOCKET, RHODE ISLAND

**TP means TOP PRECISION**





**BACKREST HOLDER  
FOR TURRET**

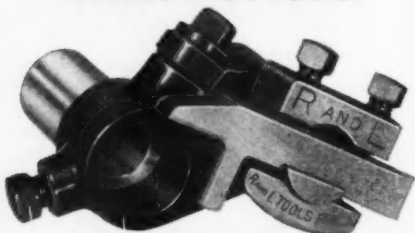
The R and L Backrest Holder for Turret shown above is designed to coordinate with the R and L Turning Tool to attain more flexibility in set ups with fewer tools.

You can see by the illustrations that by using the Backrest for Turret with a Carbide Backrest or Roller Backrest it can be used as a turret support for cross slide work.

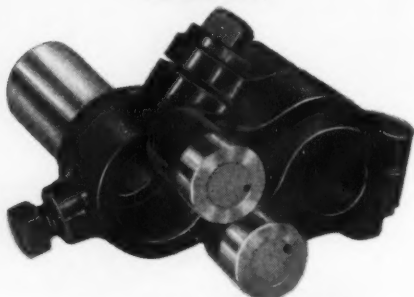
Also, by using the Backrest for Turret with the Angular Cutter Holder which comes with the Turning Tool, or can be obtained separately, it can be set up as a single point turning tool or centering and facing tool, at very little additional expense.

Just another example of the versatility of R and L Tools. Send for our new 28 page catalog for other suggestions on how to reduce your tooling costs.

**CUT TOOL COSTS WITH THIS  
REALLY VERSATILE  
BACKREST FOR TURRET**



**CARBIDE BACKREST  
HOLDER**



**ROLLER BACKREST  
HOLDER**



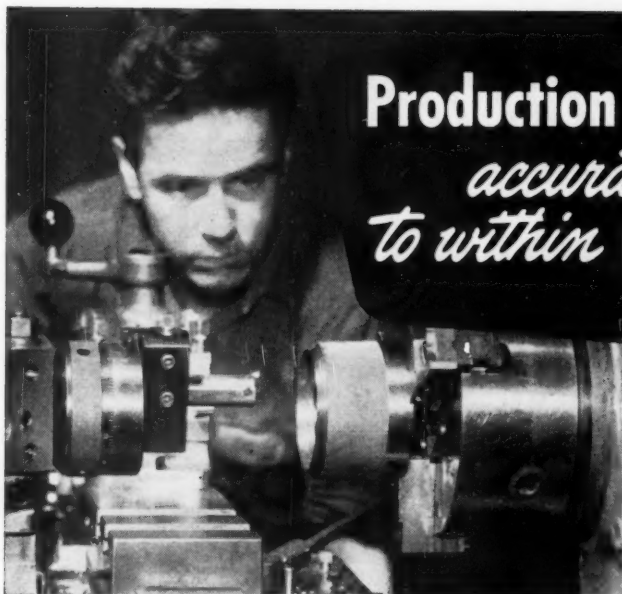
**SINGLE POINT  
TURNING TOOL**

**R AND L TOOLS**

Send for our new 28 page catalog.

**1825 BRISTOL ST., PHILA., PA.**

TURNING TOOL—UNIVERSAL TOOL POST—FLOATING DRILL HOLDER—CARBIDE AND  
ROLLER BACKRESTS—REVOLVING STOCK STOP—TAP AND DIE HOLDER—CUT-OFF BLADE  
HOLDER—TURRET BACKREST HOLDER—RELEASING ACORN DIE HOLDER—KNURLING  
TOOL—RECESSING TOOL



**Production Boring**  
*accurate*  
*to within 0.0001*

### With New Improved E-Z Set Boring Tools!

Here is a tool to end your precision boring problems. E-Z Set boring tools are accurate to within 0.0001" . . . employ micrometer-type adjustment . . . facilitate rapid and accurate set-up . . . utilize interchangeable shanks for application with any machine tool . . . and have a wide range of adjustability to meet specific requirements for any precision boring job.

MAXWELL E-Z Set boring tools feature increased tool rigidity through utilization of larger dove-tail areas and ground-fit male and female dove-tail sections.

E-Z Set Boring tools are available in three models having maximum boring bar capacities of 1/2, 1 and 1 1/2 inches. They cover a boring range of from 3/8 to 20 inches. Boring bars and socket keys are furnished as standard equipment.

WRITE TODAY FOR CATALOG



- ✓ Micrometer adjustment
- ✓ Boring range to 20"
- ✓ Interchangeable shanks
- ✓ Universally adaptable



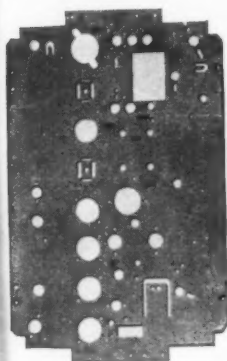
216-MC

# THE MAXWELL COMPANY

221 BROADWAY • BEDFORD, OHIO

SEE THE AMAZINGLY FAST  
**PIERCING SPEEDS**

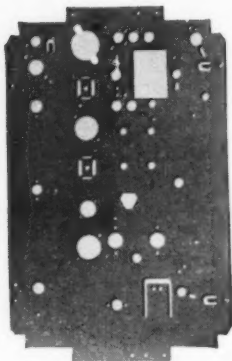
OF THE  
**WIEDEMANN RA 41-P  
TURRET PUNCH PRESS**



**A**  
PIERCING TIME  
PER PIECE AS SHOWN  
**6 min. 28 sec.**

Lot of 176  
3 Handling Operations  
Size 8 7/8" x 14" x .047 steel

Panels A and B are somewhat similar. After producing 176 pieces of panel A, engineering changes were made and incorporated in the template. Production was complete on Panel B.



**B**  
PIERCING TIME  
PER PIECE AS SHOWN  
**5 min. 43 sec.**

Lot of 1374  
3 Handling Operations  
Size 8 7/8" x 14" x .047 steel

**LOOK  
AT THESE  
TIMES!**

**Then see the  
RA 41-P in  
operation**

**WIEDEMANN MACHINE COMPANY**

**4265 WISSAHICKON AVE. • PHILADELPHIA 32, PA.**

**ROTOR TOOLS**  
**"PAID OFF"**  
**IN 30 DAYS!**



**A** MANUFACTURER of impellers found grinding in corners and around curves a tough, time-taking job. Then the Rotor Application Engineer gave his recommendations.

Straight wheel and cone grinders were replaced with Rotor Air Verticals that use 9-inch flexible sanding pads. This eliminated all wheel marks, made it possible to get into those curves and corners, and use the same type grinder for all operations.

The result—a 21% reduction in grinding time. Thus the Rotor tools paid off their cost in less than 30 days. Production quality is better too.

Want to get similar benefits in your grinding operations? Call in the Rotor Application Engineer, or write for Catalog 35.

**AIR O'TOOL**

AIR •

THE **ROTOR TOOL** CO.

CLEVELAND, OHIO

• HIGH  
CYCLE

UNBIASED ANALYSIS OF YOUR GRINDING PROBLEMS



## Grinders you can't **OVERWORK**

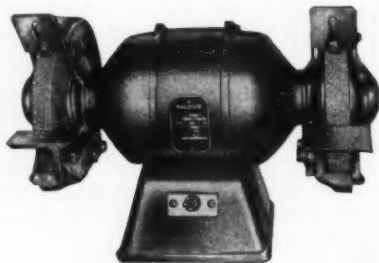


The  $\frac{1}{2}$  hp motors that power these Baldor Grinders have no commutator, no centrifugal switch, no brushes—really trouble-free motors that will not burn out even when over-loaded repeatedly. Electronically balanced within 1/50 ounce of perfection, the armatures rotate at 3400 RPM without vibration—an engineering achievement that makes true precision work possible. Only first-grade wheels are used, and we re-check these at our plant for balance; Baldor Patented Balance Flanges are added when necessary. These grinders are built to do precision work and take plenty of punishment at the same time.

Phone your industrial distributor now or clip this ad to your letterhead and mail for grinder bulletins.

**BALDOR ELECTRIC COMPANY**  
Motors-Grinders-Battery Chargers  
4368 Duncan Ave. St. Louis 10, Mo.

ABOVE: Carbide Tool Grinder with reversible motor for sharpening both left and right hand tools. ....\$142.60



ABOVE: No. 8100 Grinder. 60 cycle, 1700 rpm motor. 8" x 1" first-grade wheels. (36 and 60 grit.) Heavy shaft,  $\frac{3}{4}$ " arbor. ....\$88.00





# "SLASH

## YOUR SET-UP TIME

WITH THE

# TREE

## TAPER BORING TOOL

Cut expensive set-up time from hours to a few minutes with the revolutionary TREE taper boring tool. You can use it on your present milling machine, jig borer or boring bar. Write today for complete information. In addition to boring taper holes this tool can be used for —



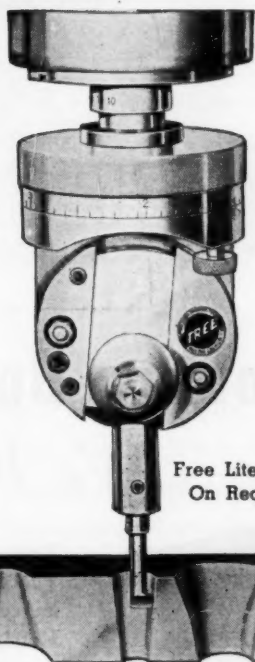
\* Straight boring . . . as shown at left used as offset boring tool.



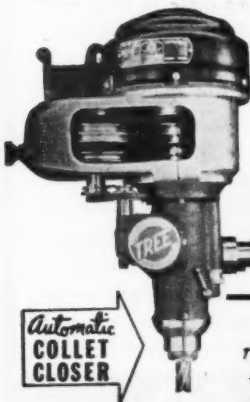
\* Facing . . . up to 10" in diameter.



\* Outside Turning . . . either straight or tapered up to 8" with extension bar.



Free Literature  
On Request



Automatic  
COLLET  
CLOSER

## TREE UNIVERSAL MILLING HEAD ATTACHMENT . . .

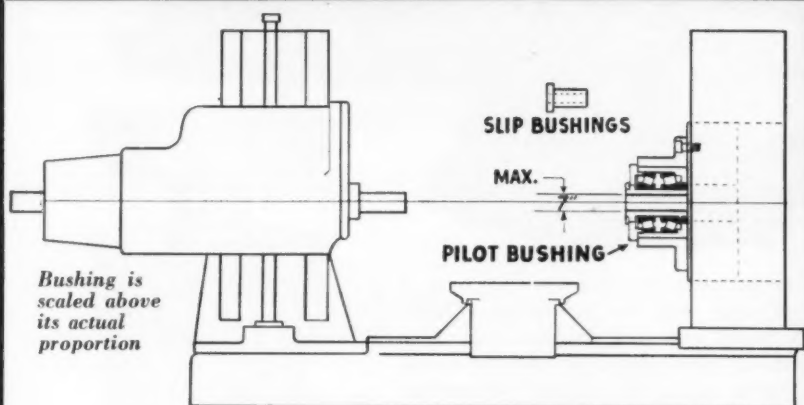
All Angle Milling, Drilling & Boring.  
Compact Design,  $\frac{3}{4}$ " Collet Capacity.  
4" Quill Travel. Power Feed Eight Speeds—  
140-3500 RPM or 210-5200 R.P.M. Hardened  
& Ground Spindle & Quill. Enclosed  
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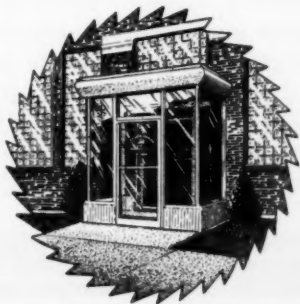
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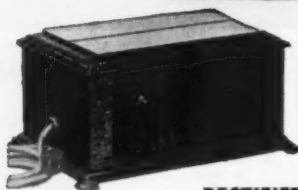
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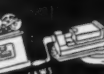
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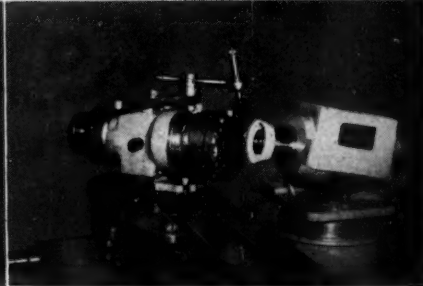
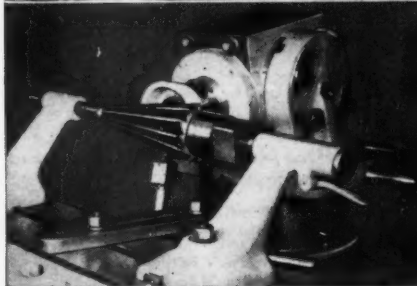
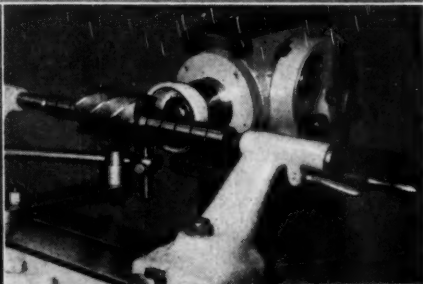
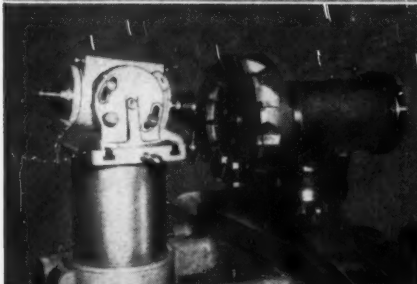
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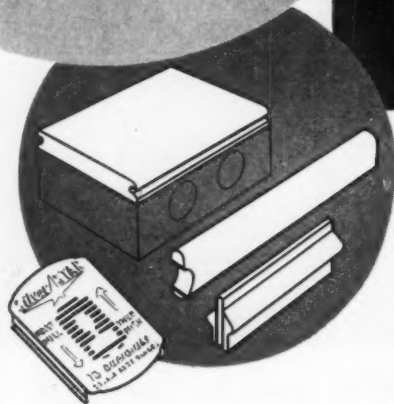


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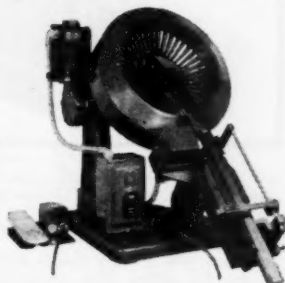
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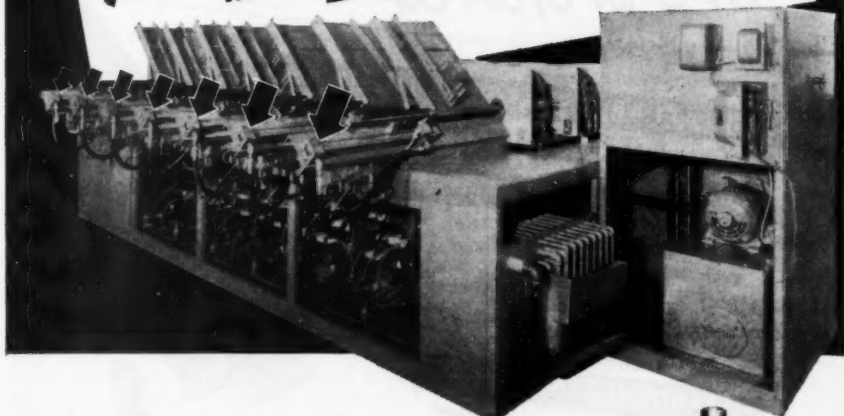
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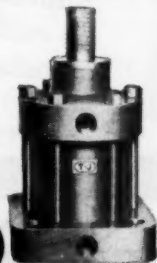
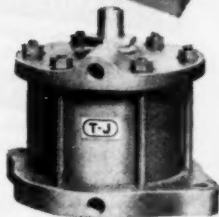
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<b>New gear hobbing machine</b> .....	<b>130</b>
<b>Special report on planers</b> .....	<b>183</b>
<b>Use of carbides on planer work</b> .....	<b>183</b>

<b>Washington news letter, by Arnold Kruckman, Washington correspondent.</b> Page .....	<b>109</b>
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<b>How's business?</b> Page .....	<b>115</b>
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**Interesting tool holder saves time on lathe operations, by Fred M. Burt.** For virtually every sort of a job that can be done efficiently on an engine lathe, tool bars are used in conjunction with the proper tool bit or other machining unit. Page .....121

**New high-speed gear hobbing machine is accurate, fast, for high production.** Michigan Tool engineers have developed a gear hobber which is extremely fast. Machine has few parts, is accurate, and easy to operate; it is ideally suited for high production on long runs. Page .....130

**Small plant modernizes . . . reduces costs of special machinery through welded design.** Here is a redesigned die milling machine which was welded to reduce costs and save time. This was an old machine which had to be modernized to enable the company to keep pace with rising costs. Page .....143

**New metal treating process speeds cold working, cold extrusion of steel.** This new chemical process extends lubrication limits in the cold working of steel. It consists of compatible cleaning, pickling, and application of a phosphate coating and specially developed lubricants to steel. Page 153

**Selection, training and supervision of foremen and supervisors, by Edmund Mottershead.** Another in a series of human relations articles by Blue Book's Ed Mottershead. Because manpower problems are going to be acute, training of supervisory personnel is extremely important. Foremen are the key in any labor relations program. Page .....163

**Special Report on Planers.** This is the sixteenth in a monthly series of special reports devoted to one type of machine tool. This issue's report is in three parts: a general article on the use of carbides in planer work; specifications of all planers manufactured in this country; descriptions and photos of late model machines. Page 183

**Carbide tools and some case histories on the use of carbides on planer work, by William F. Schleicher.** The author has gathered together a collection of photos of tools which lend themselves admirably to planer applications. Article contains some excellent case histories of manufacturers who have used carbide to advantage. Page .....183

**Baker Oil Tools, Inc. cuts paper work by two thirds.** In these days when the amount of paper work which the average company has to perform is becoming a real headache, it is interesting to learn of the steps which one company has taken to reduce this expensive indirect labor. Page .....215

**Modern tools in action.** Page .....227

**Shop hints.** Page .....239

**Professor Reichardt's quizzes.** Page 231-242

**Available literature.** Page .....249

**New books.** Page .....260

**News of the industry.** Page .....270

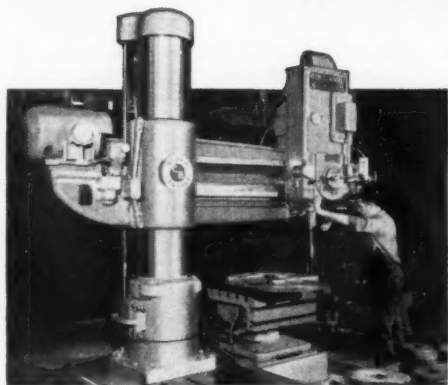
**What's new in metalworking.** Page .....281

**Mechanics through the ages.** Page .....386

**Products index.** Page .....388

**Index to advertisers.** Page .....394

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**THE CINCINNATI BICKFORD TOOL CO.** Cincinnati 9, Ohio U.S.A.

AS THE

# Editor

SEES IT

## **Subsidies and wealth**

Now that the machine tool industry is in great confusion, having gotten there through governmental ignorance and mismanagement, a panacea to resolve the chaos is being whispered about in high NPA and OPS circles. The cure-all? Subsidies!

My argument is not with whether a subsidized machine tool industry will produce tools faster or better, but my argument is with the pernicious ideology that every problem can be solved with money, that every stumbling block can be pried away with a crowbar of gold.

Wealth, improperly used, destroys a nation by sapping its vitality, by removing the urge to help itself. We see our government's odd use of money in subsidizing farming, aviation, special groups, etc. Such largesse is always considered stop-gap, a helping hand, to be withdrawn when the patient is able to help himself. Unfortunately, the patient soon begins to depend on the medicine so much that he can no longer help himself without dying. He continually needs more medicine.

Whenever a problem arises the government's first thought is to give money. It's the easiest help to give. The problem is silenced, not eliminated; it will rear its ugly head the moment the flow of money is stopped. We seem to have gotten away

from the quaintly old-fashioned idea of trying to solve a problem at its root and helping in the solution by tearing out the root.

How many industries which have been subsidized for years have solved their problems in spite of the subsidies they have received? In most cases no attempt has been made to solve the peculiar situations which made it necessary for the government to support certain segments of our economy.

When subsidies begin the will to fight atrophies.

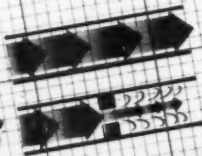
Worse than the subsidies given to industries and nations is the thinking that mere wealth will win all of our battles. A commentator pointed to our huge national income and the amounts available to us in case of war. A rosy enough picture for us all to be complacent and think we're invincible. All we need to do is open the vault at Fort Knox and the enemy will be struck blind and capitulate. Would that it were so.

There are times when money is needed as a limited, assisting agent; it must be given with discretion and other forms of help must not be ignored. Today's government thinks of money as the alpha and omega of all problems. The sooner this vicious thought is destroyed the better will be the backbone of the economy.

*William F. Schleicher*

with Ross Full-Flo In-Line Valve  
you get Full Pipe Capacity!

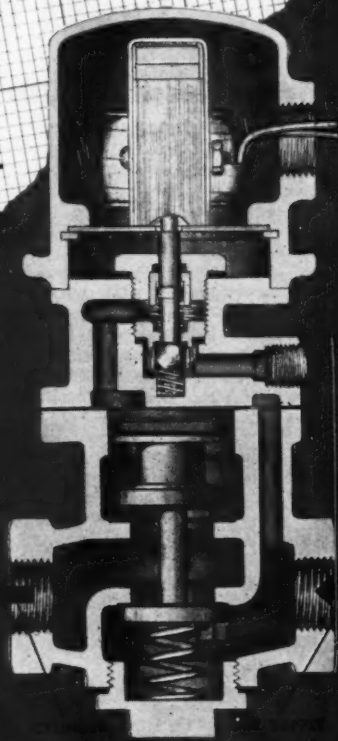
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THE BRIDLE FOR  
AIR HORSEPOWER

**ROSS** OPERATING VALVE CO.

by Arnold Kruckman

Washington Correspondent



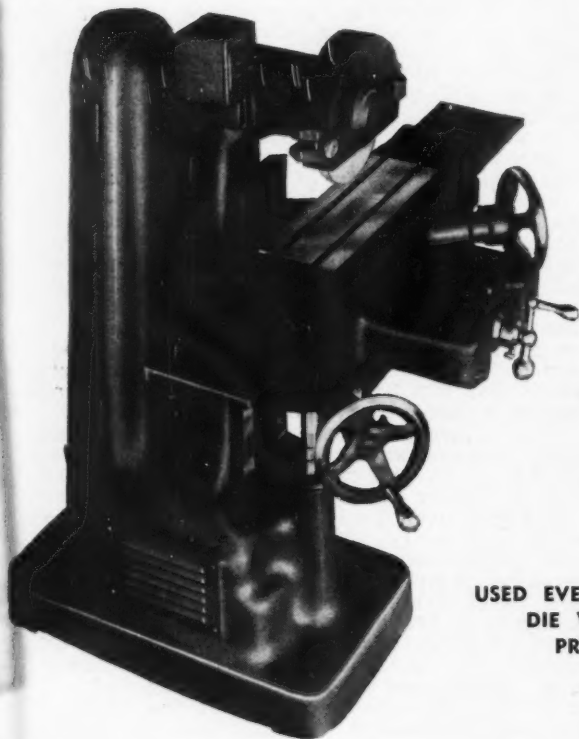
OPS clearly intends to stall increases, permitted by the Capehart Amendment of the new Defense Production Act, as long as possible. Individual, single, separate units of the thousands upon thousands of firms composing the national economy are forced to make individual applications for increases with the additional cost factors. The Capehart Amendment defines "costs" as including material, indirect and direct labor, factory, selling, advertising, office and all other production, distribution, transportation and administration costs. Broadly, the Capehart Amendment is expected to wipe out most rollbacks.

OPS reluctance to act the Capehart way swiftly brought threats of legal proceeding from various large corporations, such as Chrysler, who promptly filed for price adjustments under the new law. Every trade association represented in Washington, functioning for manufacturing groups, was bombarded by letters, telegrams, telephone calls prodding for action. This pressure brought from Mike DiSalle the solution that an order be issued indefinitely postponing compliance with August 13 date line for filing the various reports and statements; but requiring all rollbacks to be made on that date. Eric Johnston was informed about the proposed order a few hours before it was to be issued. The economic stabilizer, DiSalle's boss immediately ordered both compliance and rollbacks be indefinitely postponed. A rather flurried and confused Chief Counsel, Harold Leventhal, appeared at a hastily called press conference and announced the postponement. In essence, this was a retreat from the intention of the eleventh hour revival of all basic manufacturers' pricing orders issued an hour before Truman protestingly signed the new Defense Production Act. However, apparently, OPS made an attempt at saving face by announcing the method of making the Capehart Amendment operative would be delayed, at the very least, three months. Impression here is it will be much longer before a clear interpretation comes from OPS, which will enable business people to secure Capehart price ceiling privileges in groups of allied or identical industries. Obviously the present proceeding is almost impossible. Each case must be considered individually. OPS now has 12,000 employees here and in the field. OPS officials themselves have estimated it would take at least 1,500,000 employees to handle the applications for price shifts under the Capehart Amendment.

\* \* \*

Washington realizes machine tools are the key to action all along the line in the defense industries. Why there are blockades in the highest quarters is almost inexplicable. Word comes General Services Administration may delete the 4% requirement from the offer to advance 30% financing needed by pools. OPS, which regards its GOR-15 as the ultimate of generosity to any industry, also is reported to be almost ready to do better.

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FEATURES



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TABLE WAYS**

**USED EVERYWHERE FOR TOOL &  
DIE WORK AND SMALL  
PRODUCTION RUNS**

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MT 101**

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**PRECISION GRINDERS**  
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Defense Mobilizer Wilson directed Government agencies to make special efforts to solve manpower shortages in the machine tool industry, to amend practices so there may be special draft deferments, to soften wage controls, to step up training programs, and to break highly-skilled job performances into several lesser-skilled operations. Orders went to national and area labor-management committees, to draft boards and wherever the orders might have effect in the Defense Department. Draft boards were especially urged to stop calling skilled machine workers; and Defense Department was requested not to take Reservists.

Franz T. Stone, Assistant Administrator in charge NPA Industrial and Agricultural Equipment Bureau, thinks machine tool industry should have super-priorities and better financing. . . . Harold R. (Bill) Boyer, brought from the General Electric Engineering Division, is Director of the new Aircraft Production Board, with orders to lick the machine tool bottleneck before he does anything else. . . . Boyer has been touring, visiting among automobile plants and machine tool units to solve the problem. Told reporters he found the schedule 22 months in reverse. He points out special needs for new machine tools have developed since the last war. Thinks auto plants can give only limited help. They simply can't be regarded as a major factor in solving machine tool problem. Boyer thinks machine tool industry itself must handle the problem. Suggests new capacity must be built, or auto plant space used. They tell you here auto people are not very eager to take on machine tool production.

\* \* \*

Harry Hawkins, Chief of Priorities and Distribution of NPA Metal Working Machinery and Equipment Division, veteran of WPB in World War II, (telephone Sterling 5200, ext. 4370, located in General Accounting Office Building at 3D4) specializes in machine tools. He says the Armed Services have in excess of 60,000 used tools, but that most of them are not what is needed now. Nor is he very hopeful about the effort to supply tools from stocks in England, Belgium, France and Switzerland. He thinks most of the tools to be had from abroad would be useless surplus. Hawkins, like many others here, thinks what is needed first is a general, overall, small organization, familiar with machine tool problems, to function in Government solely on machine tool needs. There is growing opinion there should be available a great fund of money to finance new plants, new tools, new operations in a big way. Hawkins feels the industry itself can finance normal operations which do not demand plant and other abnormal expansions.

\* \* \*

In the near future the President will send a message to Congress requesting certain amendments to the new Defense Production Act. New law does not permit Government to take over existing plants or to build new plants, but government may install machinery and equipment in Federal and private plants. Subsidies are permitted for production of non-farm materials and equipment, either through direct payments, or through purchases and resale of commodities. President has been told by NPA Metal Working Machinery and Equipment Division, even if present capacity of machine tools industry is doubled, production will not

# QUALITY

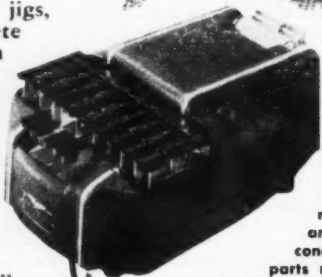
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Consult us on your metal-working problems today. Our engineers will be glad to work with and for you to give you higher production at less cost.



## STENOGRAPH

is a typical example of a precision machine mass-produced at Quality. All the parts are stamped in our modern pressrooms. The tools and dies are kept in perfect condition, producing the precise parts required for correct operation of the assembled machine. An efficient production line is in constant operation assembling the Stenograph at the lowest possible cost to Stenographic Machines, Inc., for whom the machine is built.

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TOOL & DIE MAKING • STAMPING  
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be sufficient. It is anticipated the President's message will devote considerable text to the need of more dependable information about machine tools, about super-priorities for materials facilities, tools, skilled workers, adequate financing and adequate extension of certificates of necessity, and for increased depreciation on plant equipment used in two or three shift operations.

\* \* \*

NPA Metal Working Machinery and Equipment Division, which includes machine tools, is headed by H. L. Tigges, as Director. Tigges is Executive Vice President of Bakers Brothers, Toledo. His office is on the third floor of the new General Accounting Office Building. His telephone, Sterling 5200, ext. 4687. . . . Paul Gaston at the new General Accounting Office, telephone Sterling 5200, extensions 4687, 4688 and 4629, tries to help machine tool people who are seeking sub-contracts or who seek sub-contractors. . . . NPA office of small business, which is expected to administer the \$50 million revolving fund created by the new Defense Production Act, will soon have a new head. John Pritchard, the Denver man, in accord with the policy of rotation practiced throughout NPA, has left Washington. Under the provisions of the new law, the NPA Office of Small Business is expected to take over defense contracts in order to sub-contract as much as possible to smaller business men who have hitherto been excluded. It will secure financing through RFC, and help the sub-contractor in every other way. . . . The Office of Small Business has a Procurement Assistance Division, under direction of Ernest Reisner, in the new General Accounting Office, telephone Sterling 5200, ext. 3011. Most of the new duties of the Office of Small Business will come under Reisner. . . . Those hunting sub-contracts of any kind may get help from the Central Military Procurement Agency, Old Post Office Building, 12th and Pennsylvania Avenue, Washington, D. C., 'phone Liberty 5-6700, ext. 6-6151. . . . NPA has a very efficient Business Advisory Center in the old General Accounting Office, first floor, 'phone Sterling 5200, extensions 5280, 5279 and 5310. J. L. St. Lawrence is in charge. He will run down any facts that you may require.

\* \* \*

NPA has a Facilities Bureau which is credited with making action in behalf of expanded financing difficult for the machine tool industry. This Bureau, as well as some of the high level officials in OPS, are credited with the opposition which hitherto has balked the freeze of sellings for machine tools at price levels as quoted during January, 1951. The opposition is attributed to ignorance. For instance, GOR-15 was drafted without consulting the industry. . . . These people, in all sincerity, now urge subsidies of the industry, which the industry doesn't want. . . . Incidentally, most of the machine tool problems in OPS now come under Edward L. Norman, Chief of the Cutting Tools and Industrial Materials Section of the Machinery Branch headed by Leslie J. Carson. Norman came from the Industrial Supply Company at Norfolk, Virginia. His office is in Room 2510 Tempo S Building, 7th and Adams Drive, S. W., telephone Sterling 4200, ext. 8976.

# KRW MEET THE PRESS

that armed 681,549 World War II "soldiers"

Tool boxes are vital weapons of war! Master Metal Products of Buffalo, N.Y. turned out more than 600,000 of them during the war with their KRW 125 ton Hydraulic presses. And the same presses are still going strong today!

You get both versatility and rugged service in a KRW Hydraulic press. They come in one, two or three cylinder models; either hand operated, air operated or motor driven; 25 to 150 ton capacities. KRW Hydraulic presses are self-contained above ground. And they'll do much of the work formerly reserved for heavier, costlier equipment . . . at far less cost.

KRW can give you immediate delivery on standard presses. If you need a special press, we'll build it for you fast!



KRW Hydraulic presses eliminate several forming operations and at the same time produce one of the strongest seamless drawn industrial tool boxes on the market. Incidentally, Master Metal also makes their famous Sanette sanitary waste receivers on KRW presses.

*Ask your machinery dealer to quote prices or write or wire Dept. 13*

**K R WILSON**

**215 MAIN ST.  
BUFFALO 3, N. Y.**

# How's BUSINESS ?

## Labor and machine tools

Secretary of Labor Tobin met with the AFL and CIO representatives of the national labor unions mostly concerned with production and manpower problems in the machine tool industry. This meeting followed a meeting held previously with representatives of management of the machine tool industry.

These meetings comprised one of the initial steps to be taken in carrying out the directive of Director of Defense Mobilization, Charles E. Wilson, in developing a manpower program for the machine tool industry.

"Growing labor shortages, especially in scarce skills, is only one phase of the problem facing the industry at this time," Tobin said. "It is an important problem. . . that must be solved through cooperation between Government, industry, and labor."

Employment in the machine tool industry is expected to expand by 50% or more than 40,000 workers to meet an annual production rate of \$1,875,000,000. Defense orders amounting to \$2,900,000,000 are expected to be placed within the industry in fiscal 1952.

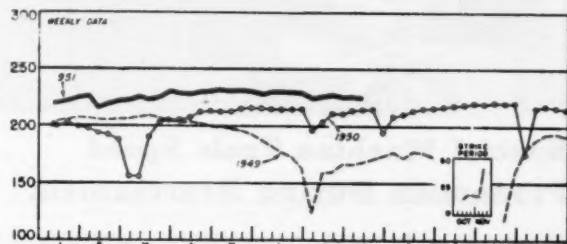
To meet its production schedules in 1951 and

## General business indicators

source: Dept. of Commerce

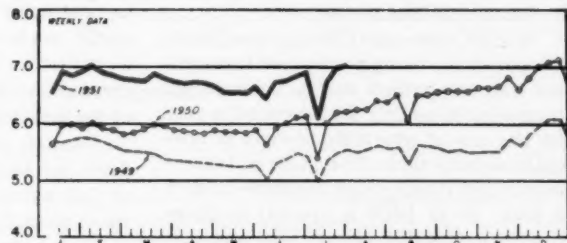
### Steel ingot production

(1935-39=100)



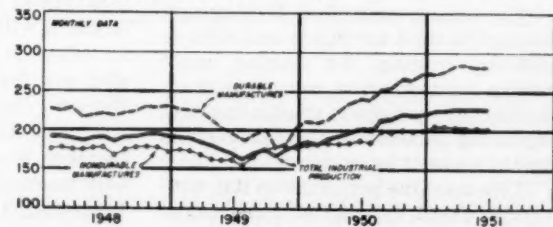
### Electric-power production by utilities

(Billions of kilowatt hours)

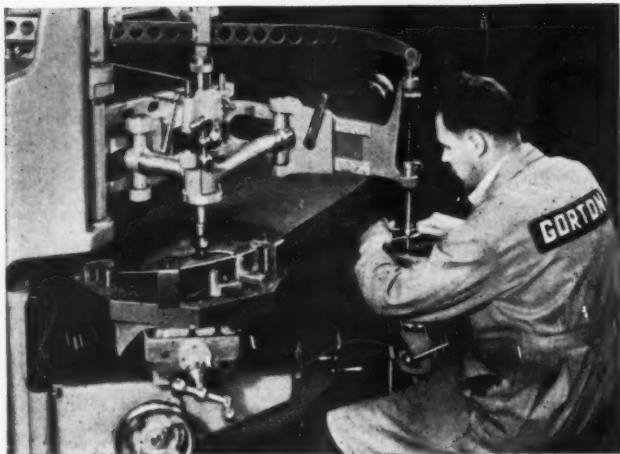


### Industrial production

(Seasonally adjusted, 1935-39=100)







Tracer-Controlled Pantograph cuts and rounds thermal slot in 8-foot steel propeller blade in 40 minutes; previous time was 5 hours, 10 minutes — just one of hundreds of examples of time and cost saving with tracer-controlled Pantograph machines.

## Special Machine Tools Speed Production During Rearmament

by  
GEORGE GORTON III  
Executive Vice-President,  
George Gorton Machine Co.

**I**NDUSTRY'S foremost responsibility right now is to produce faster, to highest quality standards and at lower cost — whether on defense contracts or for our civilian needs.

Today, there are literally thousands of operations being performed throughout industry which can be speeded up, improved in quality and lowered in cost by the use of available models of special machine tools. The modern tracer-controlled Pantograph machine is such a tool. It is both a special purpose machine, ideal for short runs, and it is an accurate single purpose machine which turns out identical parts or pieces to meet tight production schedules.

The tracer-controlled Pantograph machine is used for inside and outside profiling, routing, die sinking, mold cutting, counterboring, contour milling, chamfering, grooving, graduating and engraving in ferrous and non-ferrous metals, as well as in plastics.

This machine performs on flat, uniformly curved, cylindrical, spherical or

irregular shapes — it works in either 2 or 3 dimensions, in all directions on a horizontal plane, and vertically. It employs enlarged masters, templates or patterns which are quickly and easily made and operates normally at a reduction ratio thereby increasing accuracy — exclusively characteristic of the pantograph.

Single or repetitive accuracy — from one piece to thousands — manual or full automatic operation depending upon quantities — work sizes from the size of a dime to as large as 10 feet.

A new booklet, "Pantography," explains the process and shows what this type of machine can do for you. It is yours without obligation. Write for it today. If interested, also ask for our latest General Catalog 1655. Address the George Gorton Machine Co., 1410 Racine St., Racine, Wisconsin, U. S. A.





1952, the machine tool industry will probably need 500 mechanical engineers, 500 tool and die makers, 1,000 foremen, more than 5,000 skilled machine operators and many other semi-skilled and unskilled workers.

#### Machine tool expansion

Effective immediately, machine tool builders who themselves are unable to obtain metal working equipment may apply to the NPA for assistance in getting it.

On application from a machine tool builder, NPA will review the order boards which machine tool builders submit to NPA. When the needed tool is located NPA, after appropriate review, will order the builder to divert the tool from his intended customer to the machine tool builder who needs the tool for an expansion of his facilities.

This will, in effect, give machine tool builders first call on the output of their own industry. Heretofore they had to obtain DO priority ratings, which then were filled in the order in which the DO rated orders were received by the manufacturers.

#### New agency

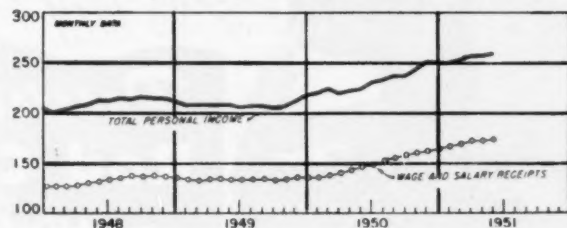
President created new agency, by authority of the new Defense Production Act, to be called the Defense Materials Procurement Agency. It will be headed by Jess Larson, now General Services Administrator. It is hoped Larson, with the new Agency, can cross-cut the conflicts which now cause so much delay in procurement and maintenance of the supply of critical and strategic materials. . . . Dr. James Boyd, Director of the Bureau of Mines, has been relieved of his post as head of the Defense Minerals Ad-

### General business indicators

source: Dept. of Commerce

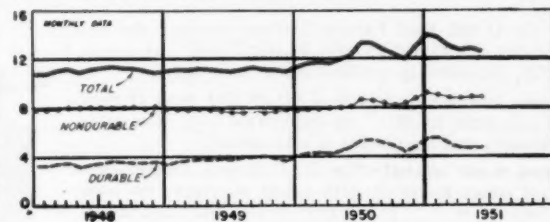
#### Personal income

(Billions of dollars, seasonally adjusted, at annual rates)



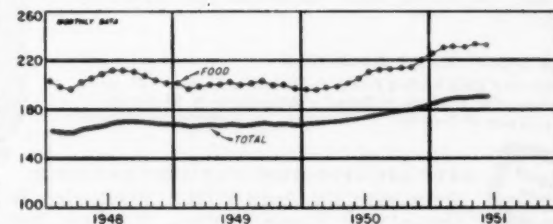
#### Sales of retail stores

(Billions of dollars, seasonally adjusted)



#### Consumer prices

(1935-39=100)



ministration. It is expected he may be replaced as Director of the Bureau of Mines. He has been at odds with the Secretary of Interior Chapman over the synthetic liquid fuels program. Boyd wanted to go slow and Chapman wished to move swiftly in spending the billion dollars before the time



## Precision Rod Cutting at High Speed

### with the New DI-ACRO ROD PARTER

The DI-ACRO Rod Parters further increase the applications of "DIE-LESS DUPLICATING" as a cost cutting, time-saving production technique.

**Do you require precision**—DI-ACRO Rod Parters hold tolerance to .001" on duplicated cuts. The ends are square, and roundness is maintained.

**Do you want speed?**—The Rod Parters exceed outputs of other methods with equal accuracy, on rods and bars up to 3/4". Torrington Roller bearings incorporated in an exclusive multiple leverage arrangement provide remarkable ease of operation.

DI-ACRO Power Parter has air cylinder cushioned for quiet and efficient operation. Each cutting cycle obtained with 4-way foot valve—leaving operator's hands free.

#### "PARTS OFF" MANY MATERIALS

All Hot and Cold Rolled Rods • Stainless Steel • Chrome Molybdenum • Fibre • Brass • Aluminum • Bi-metals • Many Types of Plastics • Copper • Rubber • Wood



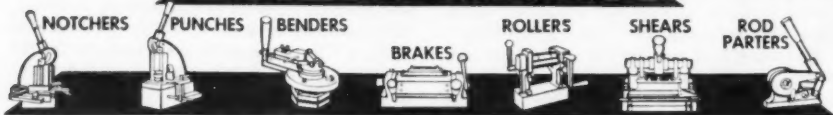
#### GET "DIE-LESS DUPLICATING" CATALOG!

Shows parts duplicated by DI-ACRO Benders, Brakes, Shears, Rod Parters, Rollers, Notchers, Punches.

#### DI-ACRO POWER PARTER

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Lake City, Minn.

## O'NEIL-IRWIN



limit set by Congress. The liquid fuels program has been independently placed in charge of Dr. Wilburn C. Schroeder, who also has been designated as Acting Defense Minerals Administrator. It is surmised he will succeed Dr. Boyd in Bureau of Mines.

#### **Labor in tool and die industry**

Tool and Die Industry Study Committee, created by Wage Stabilization Board, held hearings in Chicago and New York during August, to get clear picture of the labor situation of the tool and die industry, in the Mid-west, in New England and the East, particularly around New York. Hearings will also be held in other cities. Tool and die makers last year had highest average earnings among selected occupations, according to the report of U. S. Board of Labor Statistics. Since June, 1950, U. S. Bureau of Labor Statistics reports employment has risen by 80,000 in metal-working machinery plants. Robert C. Goodwin, Executive Director of Defense Manpower Administration, reports scarcity of skilled workers is the worst since Korean War began.

#### **Overtime pay**

Defense Mobilizer Wilson came out strongly against suspension of time-and-a-half pay for more than 40-hr. week during defense emergency. Hitherto he had strongly favored suspension of premium-pay benefits, and urged a 45-hr. week. He thinks now prohibition of overtime for all workers would lead to disagreements, tensions, unrest and loss of production. He states working period of more than 40 hrs., except at overtime rates, means waste in form of spoilage, absenteeism and inefficient work. He finds the 8-hr. day and 40-hr. week is best. Overtime pay rates, or premiums, are the strongest incentives for keeping workers on the job. He thinks overtime should not exceed a total weekly of 45 hrs., and that the absolute limit should be 48 hrs. He asks that plants, which extend the work week beyond 40 hrs., carry a continuous analysis in regard to output, time lost because of absenteeism, accidents, illness and fatigue.

#### **Materials conference**

International Materials Conference was held in which participants were Australia, Austria, Belgium, Bolivia, Brazil, Canada, Chile, Cuba, France, West Germany, India,

Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Peru, Portugal, South Africa, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States and Uruguay. In return for 70% of the world's sulphur supply during the third quarter of this year, the United States gives the rest of the world 50% of the total supply of tungsten, of which the United Kingdom will receive 25%. Prices were established at \$65 per short ton. The agreement gave the United States 78% of the available supply of molybdenum. Most of the participants opposed a world-wide price control.

#### **Gray iron foundries**

Gray iron foundries, over 100 of which closed in 1950 for lack of business, now are humming, equipped to make castings for all machine tools required in the predictable future. Booked up now to a maximum of three or four months. . . . There is plenty of vanadium, reports Government. Supply can easily be increased. . . . Steel, short here, is held back at Bockum, Germany, which is now permitted to produce 30,000 tons but easily make 100,000. ECA provided funds for operation but allied military authorities will not void restrictions. . . . OPS now permits imported copper to be sold for 27½¢ a lb., 3¢ above ceiling for domestic ore. . . . On hand in our stockpile is \$3 billion worth of material; \$2 billion worth is on order. Another \$1,500,000,000 will be made available in 1951-52 defense appropriation. Stockpile goal now is \$8,300,000,000. Largest volume of dollars buys copper, lead, zinc, tin, rubber. Unfortunately there is reported to be much partisan personal politics among top-level heads of the agencies responsible for buying strategic materials, DMA, ECA, ESA and the Munitions Board.

#### **Iron Ore**

Venezuela is shipping considerable iron ore to Sparrow Point near Baltimore. . . . Scrap is sharply decreasing in volume. Drives are in progress in Alaska and practically every State in the Union. Considerable to scrap is being brought in from the battle fields in Korea. Thirty-six million tons are needed this year. Scarcity attributed to the fact that old jalopies have not been surrendered because stiff finance terms have stopped replacement. Fifteen percent scrap comes from this source alone.



## How to Take Chance Out of Today's Alloy Buying

Here's a spark tester checking bars of Ryerson alloy steel. By reading the spark pattern thrown off when each bar is touched with this whirling, abrasive wheel, the tester determines the steel's analysis. In this way he verifies quality—guards against mixed steels.

Spark testing is only one of many steps in the Ryerson Certified Steel Plan for safer alloy buying—a plan especially important to you today, while restrictions are enforcing the use of leaner alloys with unfamiliar heat treatment response.

We also put every heat of Ryerson alloy steel through four hardenability tests, recording the results on a Ryerson Alloy Certificate which goes with the steel. These tests enable you to buy Ryerson alloys on the basis of hardenability as well as analysis—the safest way under today's changing conditions. And the test results guide your heat treatment.

So order from Ryerson where you can specify hardenability and be doubly sure. Stocks are out of balance, but in all probability we can take care of your requirements.

**PRINCIPAL PRODUCTS — BARS • STRUCTURALS • PLATES  
SHEETS • TUBING—IN CARBON, ALLOY & STAINLESS QUALITIES**

# RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI  
CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES  
SAN FRANCISCO

## Interesting tool holder saves time on lathe operations

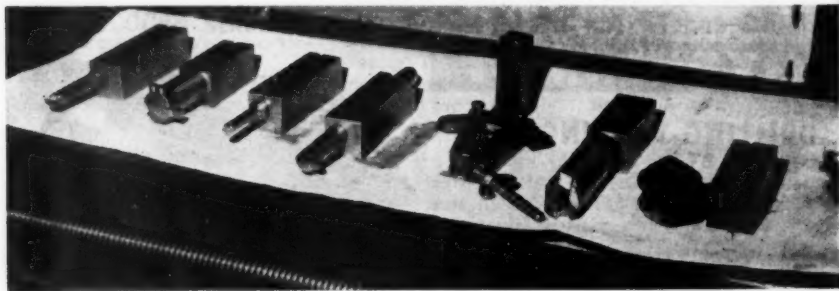
by Fred M. Burt

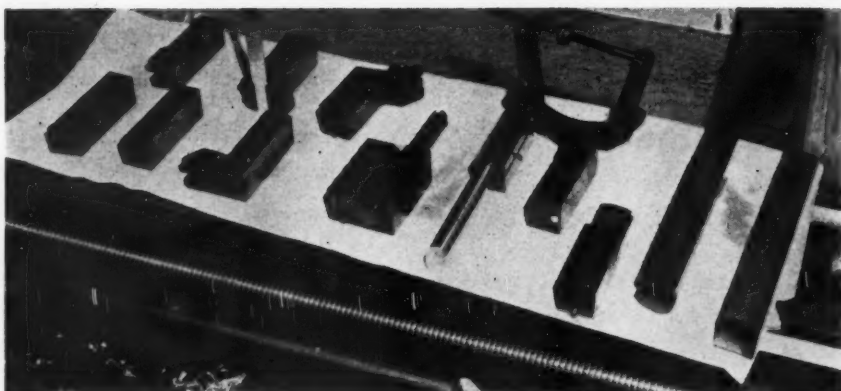
IN THE R. W. Fricke Machine Shop, San Gabriel, Calif. where a wide variety of specialty and difficult custom machine work is done, extensive use is made of a tool-holder on a 17" LeBlond Regal Engine Lathe.

For virtually every sort of a job that can be done efficiently on an engine lathe, tool bars are used in conjunction with the proper tool bit or other machining unit. These are used with a No. 2 Bakewell Tool Holder, as the basic set-up, thus making available an almost limitless number of operation changes through simply changing tool bars.

The tool holder has a riser plate which can be used for vertical spacing, but the accessory equipment is otherwise extremely simple. A hollow head,  $\frac{3}{4}$ " dia. cap screw runs down through the center of the tool holder, to fit into a T-block that fits into the lathe's T slot, and when tightened provides a rigid holding unit. The handle, with knob on the end and cam action, is moved a short distance clockwise for positive opening of the front end of the holder for removal or insertion of a tool bar. The locking pressure on the tool bar is 620 times the pressure applied manually and counter-clockwise, to the handle knob. There are three lines of contact between the tool bar

1. Some of the older bar/tool units made up by Mr. Fricke for use with the tool holder. Left to right: internal threading tools, internal counter-boring tool, internal boring tool, knurling tool (clamp type), boring bar with internal threading tool, crush type knurling tool.



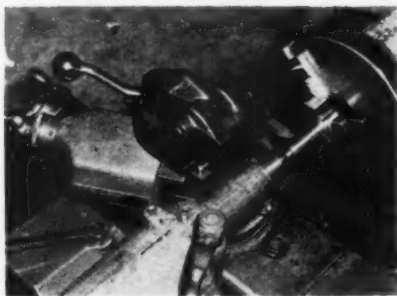


2. Other tool bars, left to right: turning bar-rocker, facing bar-rocker, threading bar-rocker, parting bar with blade, extension turning bar, extension turning bar-rocker, extension master bar with boring drill, master bar with boring bar, knurling bar (clamp type), carbide insert bar, boring bar (heavy duty), blank bar 12" x 1½" x 1½".

and the holder, this provides a positive contact which effectually absorbs and dissipates (through the mass of the holder) vibration from the tool.

Using a large number of tool bars, which he has adapted for use with all sorts of bits etc., Mr. Fricke states that, "The tool holder has increased our capacity and efficiency on turning, boring, facing, and threading jobs by at least 50% in set-up time and around 20% in machining time; also increased the life of carbide-tipped tools due to the rigidity with which they are held." See figure 1 & 2.

3. No. 2 Pakewell tool holder on a 17" LeBlond Regal.



**MORE and FASTER HOLES . . . to speed defense PRODUCTION**

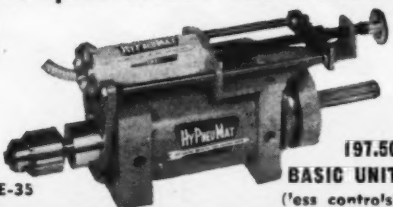
**HYPNEUMAT**

Automatic

**DRILLING-TAPPING UNIT**

Adaptable to Every Job! **3½" STROKE**  
**3/8" DRILL CAP. in steel**  
**TAPPING CAP. in steel**

Model shown 350-E-35



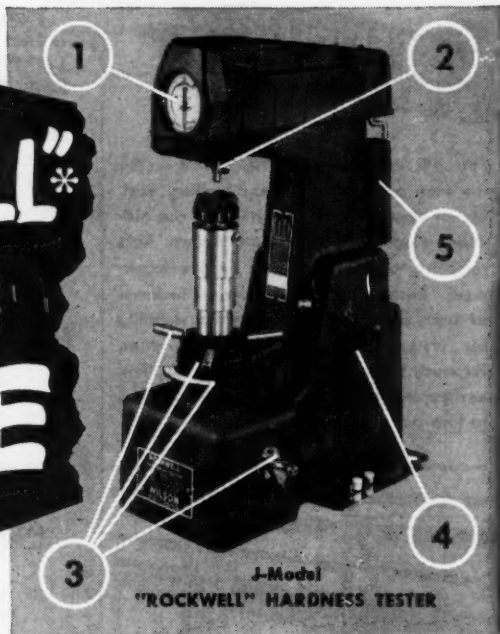
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**BASIC UNIT**  
(less controls)

**HYPNEUMAT INC., 647 W. Virginia St., Milwaukee 4, Wisconsin**



**"ROCKWELL"  
...to be  
SURE**



**You NEED these features to assure accuracy and speed in hardness testing**

- 1 Totally enclosed, dirt and dust-proof "Zerominder" dial gauge
- 2 Gripsel clampscrew for quick change and proper seating of penetrator
- 3 All controls grouped conveniently under capstan handwheel
- 4 Enclosed, easy-to-reach variable speed dash pot
- 5 Standardized weights

*The J-Model improved "ROCKWELL" Hardness Testers have higher sensitivity, increased speed, and are simpler to operate.*

Most specifications today call for parts with certain hardness limits. If you test incoming materials, you know if they meet your production requirements. You know there will be fewer rejects.

"ROCKWELL" Hardness Testers are made in two types (Regular and Superficial) and many styles with accessories so they can be adapted to testing flats, rods, rounds, and odd shapes. There is also the TUKON for micro-indentation hardness testing. Tell us the nature of the test you contemplate, and we will recommend the machine best suited to the work.

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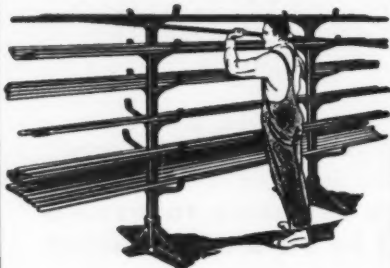
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**MECHANICAL INSTRUMENT DIVISION  
AMERICAN CHAIN & CABLE**

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## SPEEDS UP STOCK-ROOM SERVICE

The **BROWN TIME-SAVING RACK** saves the time previously lost end-hauling each bar of stock its entire length from the old-style, closed-side Rack, the Brown Rack requiring but a few inches of side movement. Each length, width and thickness of stock is displayed in gold-fish visibility for instant selection. Workmen waiting for stock are served without waste of time, and returned to their production machines to turn out a maximum of output.



Any time you require additional storage space, all you need do is add more units. If you want to relocate it at any time, you can do so quickly for it is unattached to the building. It is a simple, durable article made of metal in five styles. It can't burn, warp, sag or twist; depreciation is practically nil.

SEND FOR BULLETIN No. 26-M DESCRIBING—

**BROWN'S QUICK-SERVE RACKS**

**BROWN ENGINEERING CO.**

126 N. THIRD ST. READING, PA.

RACKS • VISES • CLUTCHES • COUPLINGS

Figure 3 shows a No. 2 Bakewell tool holder on a 17" Le Blond Regal Engine Lathe. The unit in work is a micrometer adjuster screw for a boring head made from heat treated 4130 chrome moly steel, each screw blank cut from 1 1/4" round bar stock. Each tool used has its own tool bar for quick insertion, and are—

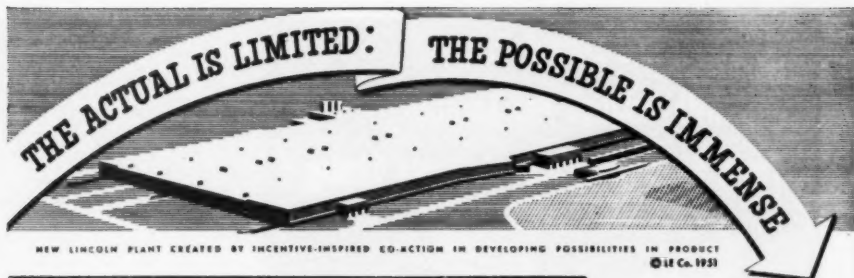
- (1) Rough turning tool for O.D. slightly over 1/2".
- (2) Finish turning to 1/2", and to 5/8" diameter (shorter length at end), also cutting two faces with same tool.
- (3) Two tool bits side by side in one bar for; (a) undercutting for thread relief 5/8" diameter; (b) cutting left hand, 5/8"-18 thread.
- (4) Chasing right hand thread, 1/2" 20, to fit thread gauge.
- (5) Cutting off finished part from the bar stock.

The unit is mounted on a small adapter chuck in a 3-jaw chuck with a tail-stock center at the other end. With this set-up it takes about 15 minutes to finish each screw.

The End



"And this is our 1/2" high-speed bit."



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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## SAVES 94% WITH WELDED STEEL

Machine designs that utilize the economies of welded steel are always lower in cost. As shown in the development of this typical machine part, substantial production savings are possible because:

**Steel costs less per pound and fewer pounds are needed.** The initial cost-saving advantage is 7 to 1 with steel, considering strength and safety factors alone.

**Approaches to efficient product shape are endless.** Stronger materials themselves can be more easily concentrated in the load-carrying areas, giving greater strength, more rigidity per pound of metal. Unlimited combinations of steel shapes can be utilized, enabling lower cost manufacture with a minimum of shop equipment.

**Get the facts now.** Your Lincoln Welding Engineer will show how your products can be fabricated with less metal and at lower cost. Simply call or write.

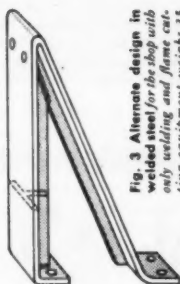


Fig. 1 Alternate design in welded steel for the shop with only welding and flame cutting equipment weighs 35 pounds... cuts only \$4.70... a saving of 46% over Figure 1.

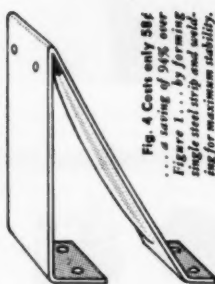


Fig. 2 Costs only \$8.40... a saving of 54% over Figure 1... by forming single steel strip and welding for maximum stability. Weighs only 9 pounds.

## the ACTUAL

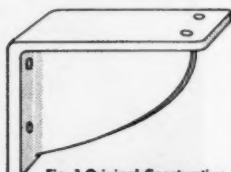


Fig. 3 Original Construction. Machinery bracket weighs 39 pounds. Has  $\frac{3}{4}$ " and  $\frac{1}{2}$ " sections. Requires milling and drilling. Costs \$9.10.

## increasing the YIELD

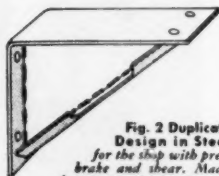


Fig. 4 Duplicate Design in Steel for the shop with press brake and shear. Made from 8 gauge (approximately  $\frac{1}{8}$ " sheet... saves 27 pounds of metal. Costs \$5.15 less than original construction.

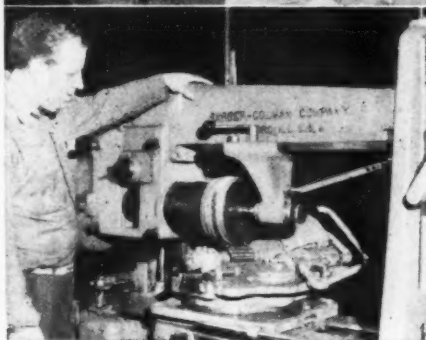
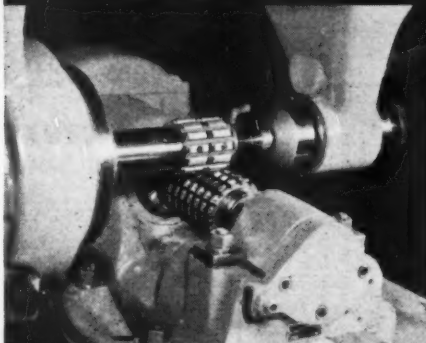
## the IMMENSITY of the POSSIBLE a saving of 56% in cost

PROGRESSIVE DESIGN CUTS COSTS FURTHER

Machine Design Studies available to designers and production men. Write on your letterhead to Dept. 265,

**THE LINCOLN ELECTRIC COMPANY**  
CLEVELAND 1, OHIO

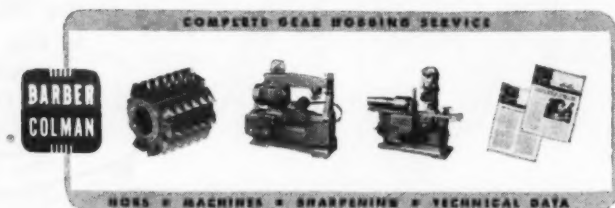
## Hob Splined Pulleys with Relative Key Location— Tooth Spacing Assures Accurate Timing



● Straight-sided spline teeth on driving pulleys for industrial sewing machines are hobbled on Barber-Colman No. 16-16 Hobbing Machines as shown in this set-up. Tooth spacing must be held to assure correct timing of the mechanism. Conversion of the job to No. 16-16 Hobbing Machine resulted in a reduction of hobbing time from 9 to 4-1/2 minutes per load of two pulleys. One machine now does the work of 4 previous machines. 3,000 pieces per hob sharpening are obtained using .045" feed per revolution of the work and 137 rpm hob speed.

## Change to *Multithread* Hobs Reduces Cutting Time From 26 to 10 Minutes. Adjacent Tooth Spacing Held to .0004"

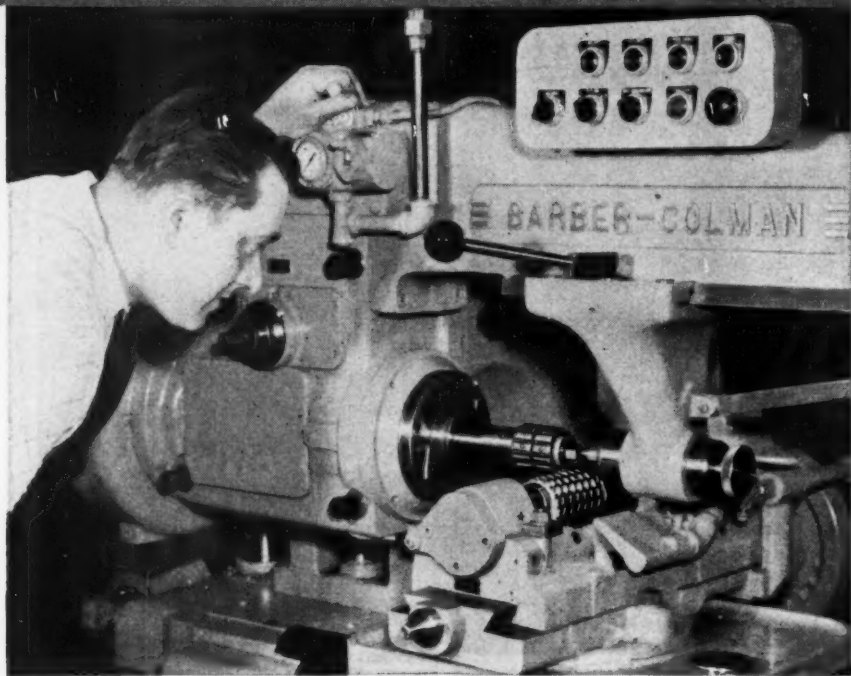
● Accurate tooth spacing within .0004" adjacent is maintained and hobbing time has been reduced more than half by changing to *Multithread* hobs on this 141-Tooth helical gear job. The accuracy of the No. 16-16 hobbing machine at high production is evident in the lead error per tooth held within .0008" over entire 7/8" face width. Gears are hobbled 2 per load, at .069" feed per revolution and 128 rpm hob speed.



BUILDERS OF PRECISION GEAR

# Barber-Colman

No. 16-16 Hobbing Machine  
**CUTS HOBGING TIME IN HALF**



● These jobs are typical of the production experience obtained by users of No. 16-16 Hobbing Machines in cutting higher quality gears *with greatly reduced machining time* . . . Recognized for its consistent accuracy under high production operation, the No. 16-16 Hobbing Machine is being used constantly for new and different operations, where precision form limits are required. This splined pulley job is an example. The more conventional intermediate gear operation shows the dependability for producing tooth accuracy at constant high production rates.

Ask your Barber-Colman representative about other new applications, proving similar production advantages.

## Barber-Colman Company

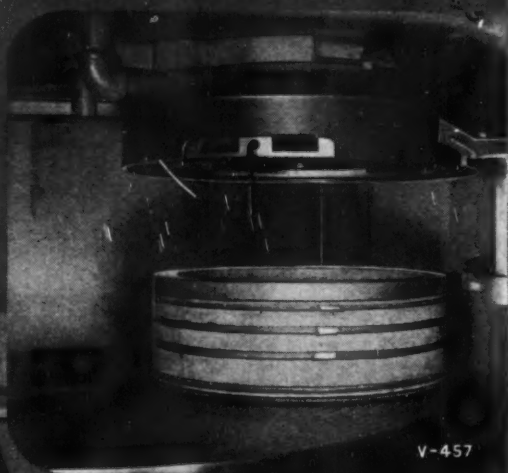
GENERAL OFFICES AND PLANT, 1819 ROCK STREET, ROCKFORD, ILLINOIS, U. S. A.

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Product of***  
**THE CINCINNATI MILLING  
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**85%**

**OF ALL METAL CUTTING JOBS**

## **New high-speed gear hobbing machine is accurate, fast, for high production**

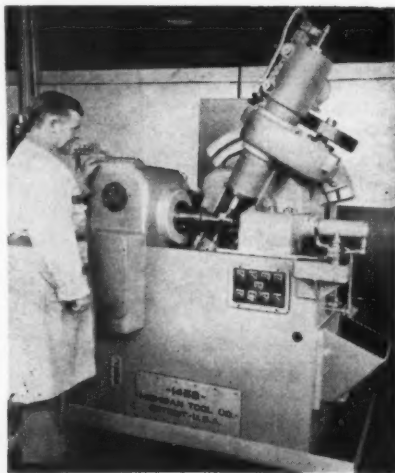
A new hobber which can turn out, for example, two 3½" dia., 9 pitch, 2" total face width, 22 tooth helical gears to close tolerances in a matter of 58 seconds, using high speed steel hobs, has been introduced by Michigan Tool Co., 7171 E. McNichols Rd., Detroit. The new hobber was designed to meet a list of desired operating characteristics not available heretofore.

Although full utilization of maximum speed possibilities inherent in the machine may have to await development

of suitable carbide hobs, it has already made possible the cutting of steel gears with high speed steel hobs at cutting "carbide" speeds. Spindle speeds are up to 1,000 r.p.m. or more.

Total relative travel of hob or work during the cut has been reduced by eliminating all except 1/16" of "approach feed" of the hob by using two distinct and separate feeds in sequence, a plunge feed to correct depth by the hob, with its centerline just 1/16" ahead of the work, followed by a traverse feed of the work across the hob to a point 1/16" past center to complete the cut.

### **1. Michigan Tool Company's new gear hobber.**



Accuracy appears to be consistent and dependent on tools rather than on machine conditions. Lead errors are avoided by mounting the lead cam (guide) directly on the work spindle, figure 2, and virtually eliminating all chance of torsional windup in the hob spindle drive. All machine movements are positively controlled and in accurate timed relation.

The machine is notable smooth and lacking in vibration at all speeds. Among the contributing reasons are: use of Cone-Drive double enveloping gearing for index and main drive gears (no bevel gears used in the entire machine), supplemented by close fitting precision shaved helical gears (spur type ratio and speed change gears); dual hydraulic feeds eliminating 2/3 of the gears otherwise required in the ma-

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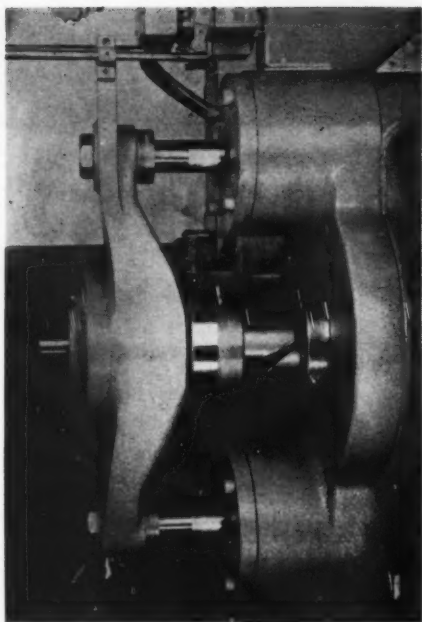
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**2. Head stock spindle end of the hobber** with lead-accuracy controlling cam guide mounted directly on work spindle. Note that outboard bearing support may be retracted and swung down out of the way for quickly replacing the guide assembly when changing over the machine.

chine, figure 3; use of a flywheel to damp out torsional vibration; use of close-fitting and shaved involute and straight splines fitting in broached bores in place of keyways; large diameter tubular instead of solid shafting for torsional rigidity, etc.

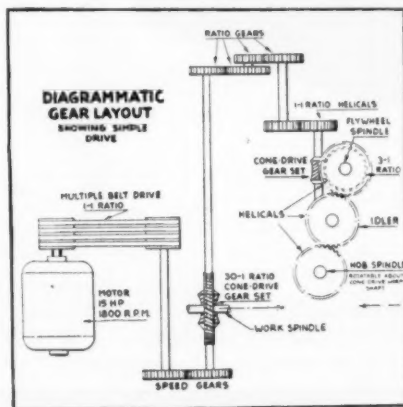
Backlash is avoided by precision fitting throughout. Hob and work spindle bushings themselves are used for "ways" for both hob and work spindle rather than using separate ways. Critical gears such as the index and main drive gears moreover, are internally adjustable to

compensate for any wear which might develop in service, figure 4.

Operation is extremely simple. The operator merely places the work in or on the head-stock spindle and pushes a button. Machine cycle even includes hydraulic advance and retracting tail-stock, and turning on and shutting off of coolant flow. Despite the high output rate of the machine, one operator can run two or more machines with ease. While manual loading and unloading is easy and rapid, the machine is so designed that automatic loading and unloading devices can be effectively used. Work is horizontally mounted; there is no tool interference; and work spindle height is convenient for either mechanical or manual loading.

Rate of feed is adjusted (infinitely variable) by setting the dials on two valves (one for the plunge-cut feed, one for traverse feed) for fast setup

**3. Diagrammatic layout of complete gear system** on the new gear hobber. Note simplicity and elimination of most gears (made possible by use of positive dual hydraulic feed principle).



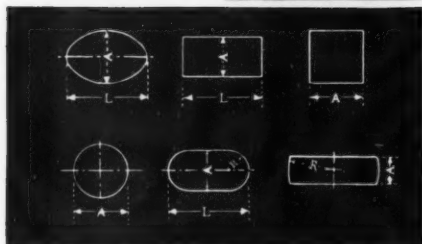


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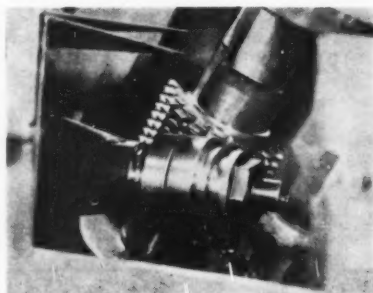
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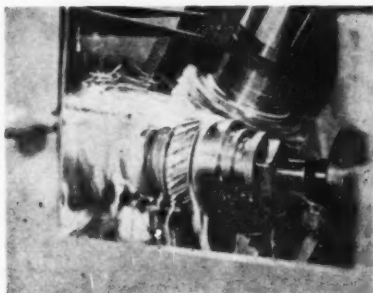
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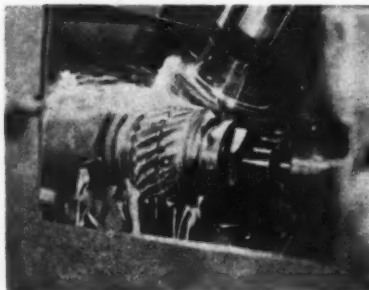
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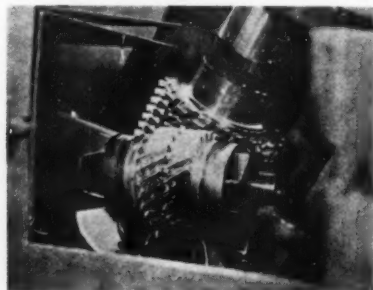
Just before button is pushed to start the cycle.



15 seconds later . . . hob completed plunge cut. Transverse feed of work begins.



37 seconds later . . . nearing the end of the climb cut.



58 seconds . . . cut is completed, hob and tail stock center have retracted.

### Typical experimental run

Gears cut at one time .....	2
O. D. of gears .....	3 1/8 inches
Face width total .....	2 inches
Number of teeth .....	22
Helix .....	31 1/4°
Material .....	SAE 5130
Hardness, Brinell .....	170-207
Hob type .....	3-thread accurate unground HSS
Feed per revolution .....	125
SFPM .....	290
Time of cut .....	58 seconds
Gears/sharpening .....	265



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and rapid determination of best hob life conditions when setting up a new gear.

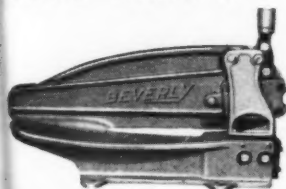
Fine pitch screw adjustments on large screws provide accurate and quick settings of hob spindle angle and depth of cut (for plunge feed). The latter adjustment is through a handwheel with a micrometer dial ( $\frac{1}{2}$ " on dial equals 0.0010" increment).

Versatility is inherent in the machine.

4. Con-Drive gears used in the hobber are of split construction so that in the event of any wear, the cam shown (arrow) may be turned to remove backlash by a slight relative shift in the two gear halves. These gears while large in appearance are actually highly compact since their double enveloping design gives them several times the load carrying capacity indicated by their center distance.

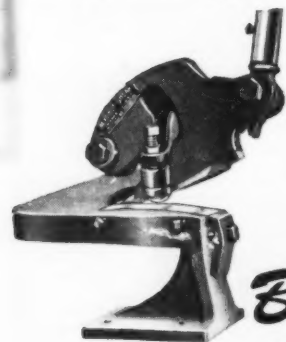
Chief limiting factor in speed of change-over is the use of a helical cam-guide (as on gear shapers) to control the accuracy of the lead when cutting helical gears. Mounted directly on the work spindle, a complete guide change (for a gear of different helix) requires approximately 20 minutes. Construction of the outboard bearing support permits quick access to the guide assembly for replacing the assembly as a unit,

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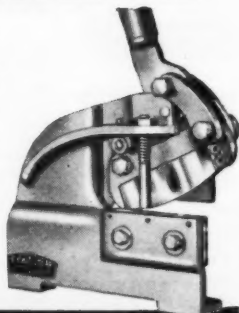
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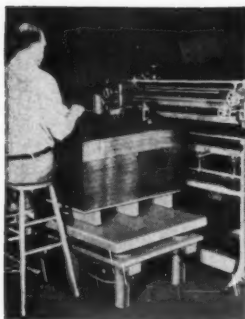
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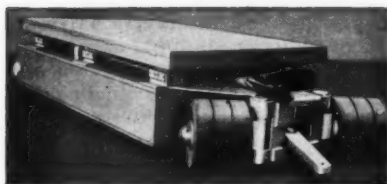
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capacity, lift, and installation details may be varied at will. Characteristics such as roller-conveyor tops, tilt tops, and the like, may also be incorporated. If your job involves lifting, leveling, or transporting, of out-size or unusual nature, our experience in solving just such problems is at your disposal. **Write for Bulletin P-501.**



Portelvator, portable elevating table for movement of automobile body dies.



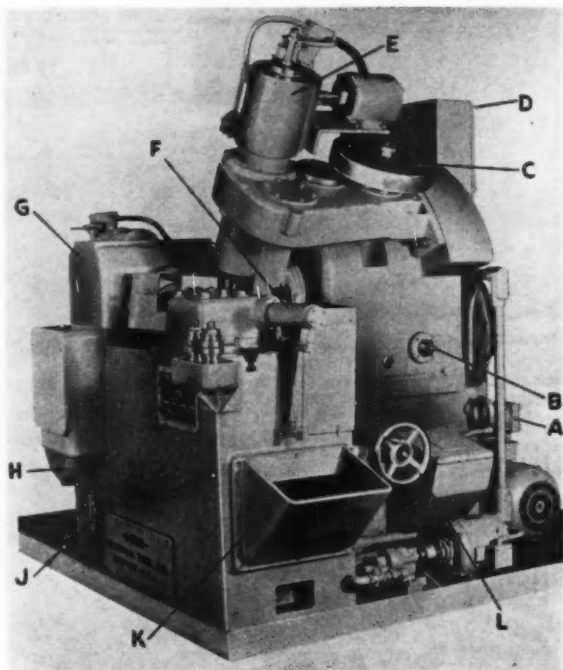
Portelvator, built for basement installation to supply extra high lift at ground level.



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5. In this view of the machine may be noted the plunge feed cylinder (A); end of fine pitch screw for setting hob spindle angle (B); flywheel to damp torsional vibration ahead of hob spindle (C); J.I.C. electrical panel (D); push-button type pre-selective hob shifter (E) at top of spindle (optional); tailstock operating and pressure cylinder (F); 15 hp main drive motor (H); coolant level gage (J); large chip removal opening (K) and micrometer handwheel for adjusting depth of cut or plunge feed (L).



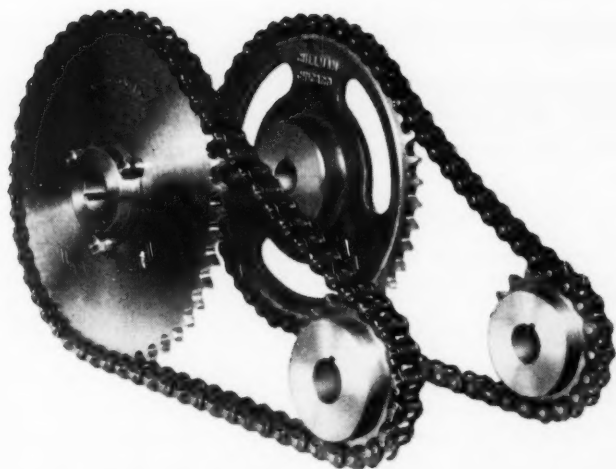
however, and all adjustments can be made in the tool room prior to change-over, if desired.

The hobber is designed for use of a specially developed push-button controlled pre-selective hob shifter (optional equipment) adjustable as to amount by setting a single counter dial in the electrical panel to the number of increments desired per shift (one increment equals .0029"). When hob has been shifted, either up or down as desired and preselected, to end of useful width (preset by dogs on shifter drawbar), a signal light on the push button panel immediately warns operator of necessity for changing hobs. Hand lever control provides rapid return of shifter.

The machine is designed to handle any helical or spur gear or spline up to 8" diameter and 4 3/4" face width. Coarsest pitch recommended is three.

The operating cycle of the machine is as follows: The operator merely places the work into or on the headstock spindle, and pushes a button. The machine then takes over.

First the tailstock center moves into place under hydraulic pressure (continuously maintained during cut). Next hob and work spindle start rotating in timed relation and the hob spindle column moves forward horizontally so that the hob plunge-feeds into the work. When proper depth has been reached, this feed stops and the work immediately starts to traverse across the hob. When the end of the work has passed the centerline of the hob, the hob spindle quickly retracts (out of the cut) the work returns to loading position, spindle rotation stops and the tailstock center retracts for removal of work and reloading.



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# CULLMAN

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**SPROCKETS and ROLLER CHAIN**

## Specifications

Model Number .....	No. 1458
Maximum gear diameter recommended .....	8 inches
Maximum gear diameter recommended .....	2½ inches
Maximum face width recommended .....	4¾ inches
Machine type .....	Horizontal single spindle
Maximum hob diameter capacity .....	7 inches
Maximum hob length capacity .....	7 inches
Minimum hob diameter recommended .....	2½ inches
Maximum center distance, hob and work spindles .....	7½ inches
Minimum center distance, hob and work spindles .....	2½ inches
Spindle speeds .....	Up to 1000 RPM or more
Feed per revolution of work spindle .....	Infinitely variable hydraulic control
Maximum swing of hob spindle .....	35° either side of center
Floor space .....	84 x 84 inches
Motor horsepower .....	15 @ 1800
Weight .....	21,000

Either climb or conventional hobbing can be used, as desired.

Where pre-selective hob shifting is used, the operator merely presses the hob-shift button as required (inoperative while the machine is going through its cycle).

Pushing the hob-shifter button after the light is lit, indicating end of useful hob width has been reached, will not advance the hob any farther. Hob shifter is also provided with quick return operated by control handle on shifter. Hobs may also be shifted manually regardless of provision of a hob shifter.

If, for any reason it is desired or necessary to interrupt the machine action before completion of its cycle, the operator merely pushes the 'return' button. The hob then immediately retracts out of the cut, and the work spindle and tailstock center return to loading position as the machine stops.

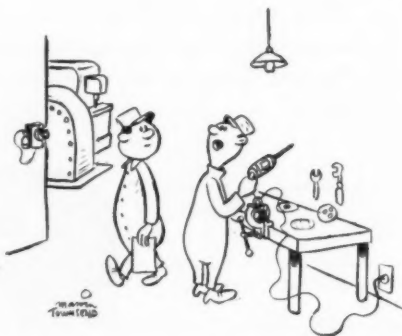
For setup, a selector switch permits independent movement of the tailstock center for machine operation without retracting this center.

Independent switches are provided for starting hydraulic pumps, coolant pumps, and for 'automatic' or 'setup' operation.

Among interesting details is the oil-air-mist lubrication. Controlled by solenoid this lubricator works only while the machine is in operation. It provides effective continuous lubrication, while running, although oil consumption is only 2 ounces in 8 hours. The rotating gears pick the oil from the air-mist.

Hob and hob arbor are placed in the machine as a unit, permitting the hob to be checked between centers for accuracy of mounting, shapening etc., before inserting in the machine.

**The End**



"I'm through with the drill, Gus. Call the union electrician to pull out the plug."



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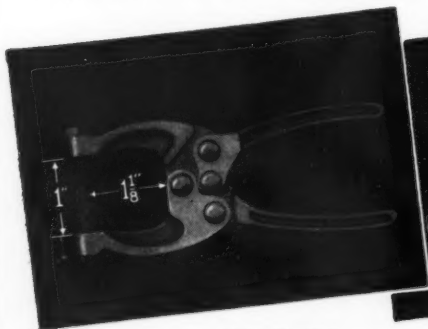
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## **Small plant modernizes . . .**

### **reduces costs of special machinery**

### **through welded design**

DECREASED cost and weight plus substantial improvements in strength and rigidity are major advantages resulting from the redesign of an inverted type die milling machine for arc welded construction.

Employed primarily for cutting small, intricate dies for the jewelry industry, the machine was redesigned by The Thurston Manufacturing Company, Providence, Rhode Island, for its own use after the original tool had become antiquated through 25 years of wear, figure 1.

The need for modernization and streamlining was mandatory to help the company keep pace with rising demand. Inasmuch as Thurston is a small plant, original costs in redesign were necessarily important. Replacement of the base in its original form would have involved a costly pattern plus expensive time delays; therefore, welded fabrication of the base was decided using  $\frac{1}{4}$  inch steel plate.

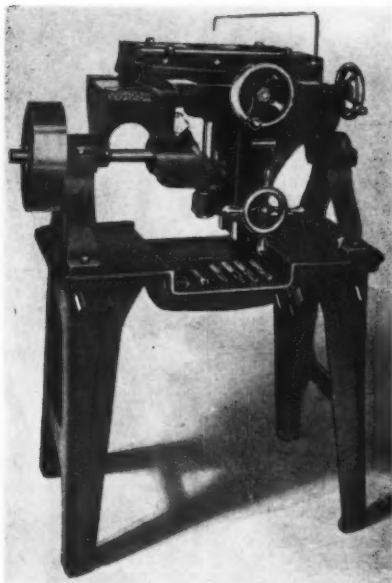
It was necessary to provide two openings in the base—one for the V-belt drive and the other to get at the draw bar for the spindle. These were cut with a torch. Three sides were

then bent into a U-shape and the fourth side was welded on. Following this, bars of 1 inch and  $1\frac{1}{4}$  inch steel were welded on inside the base at the top, with care being taken to see that the bars were welded on squarely so that no machining was necessary on top of the base where the rest of the machine was bolted.

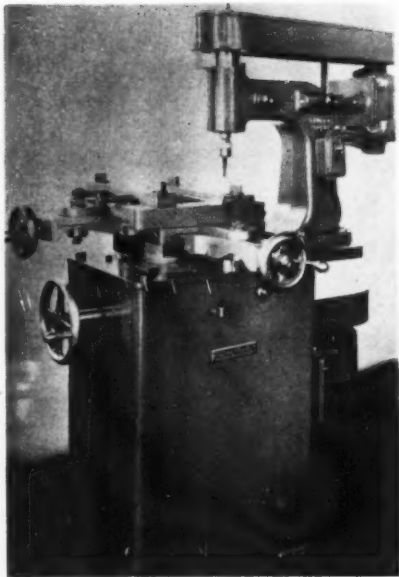
Next, a small steel bar 1 inch by  $\frac{1}{4}$  inch was welded on inside of the base just below the openings, to act as a stiffener making the base more rigid and minimizing vibration. Four pieces of angle iron with holes punched were welded on the bottom for legs to allow for fastening on skids or on the floor.

Aside from eliminating costly machining operations that would have been necessary under the previous method, the cost of the welded base was nearly 40% cheaper and the weight was reduced by a similar percentage.

In addition, a number of operating advantages have been reported. The former die miller was designed so that the table holding the die was stationary and the spindle traveled on a dovetail slide for the vertical adjustment. The chips would fall down while cutting the



**1. The original, old die milling machine . . .** which was redesigned. The machine has become antiquated after 25 years of continuous service.



**2. The redesigned die milling machine.** Substantial improvements in strength and rigidity resulted when the machine was arc welded.

die and clog up this vertical slide, and the operators were constantly bothered with frozen vertical slides.

Redesign in the new machine obviated this difficulty. A 10 inch extra-heavy pipe was used as a vertical slide guide to hold a member that raised the milling table vertically. The member that fitted into the guide had a slight overhand so that chips falling down could not get into the guide.

A  $\frac{5}{8}$  inch steel plate was cut out to fit on the base of the machine and a 10 inch hole was then burned out of the plate. The 10 inch extra-heavy pipe was rough bored and a shoulder turned on the outside to fit snugly into the 10 inch burned out hole. The pipe was then welded in position. Following this, four 1 inch thick lugs were welded at

the bottom of the pipe. The entire assembly was stress relieved and mounted in a fixture on a lathe. The hole was finished bored and the lugs faced off square with the hole. Four threaded holes tapped in lugs completed the guide.

The spindle housing was screwed onto these lugs. The housing came up through a hole in a member that fit perfectly into the 10 inch bored pipe. The whole unit was screwed to the base, thus producing a thoroughly rigid assembly. Figure 2 shows the redesigned machine.

This installation was originally discussed in a report to The James F. Lincoln Arc Welding Foundation.

**The End**

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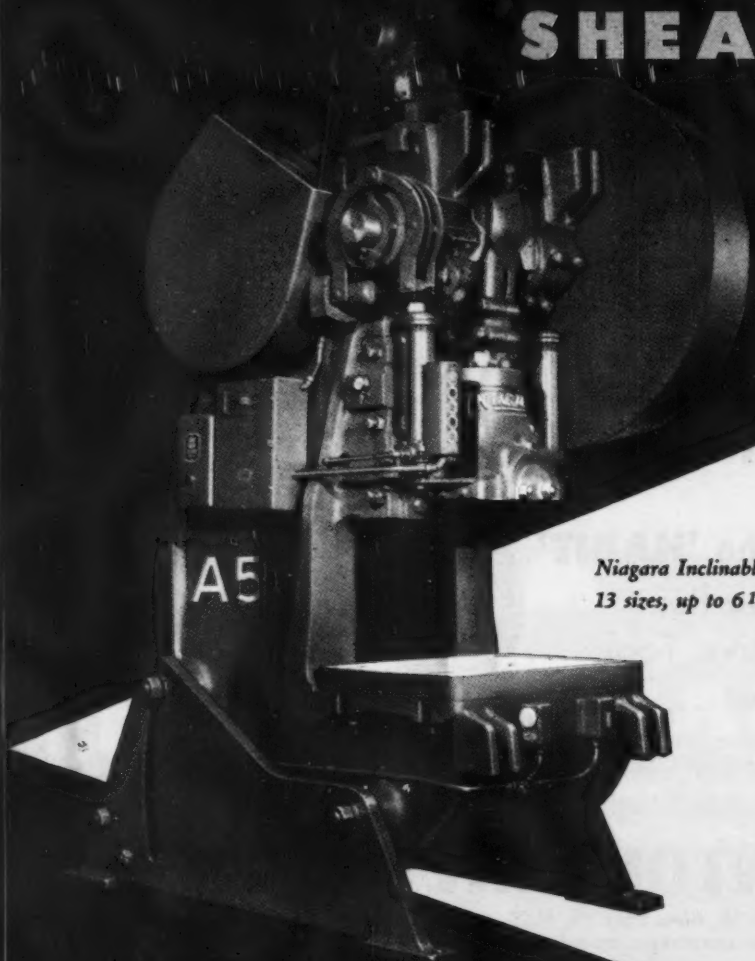
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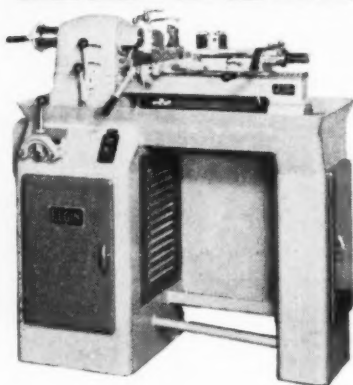
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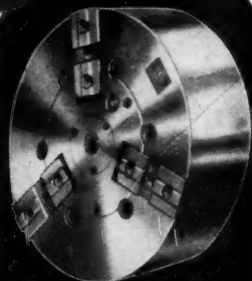


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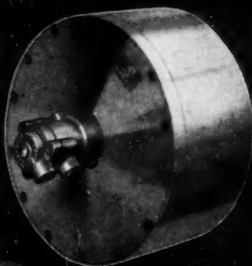
## SKINNER POWER CHUCKS

Skinner has a complete line of models for heavy duty production work on engine and turret lathes and automatic machines. Sizes from 6" to 21" with forged steel bodies, and with either 2 or 3 adjustable or non-adjustable jaws are available. The wedge angle is such that work is gripped positively, either internally or externally, regardless of jaw position. The chuck will not release the work, even if air line is broken, until operator actuates draw bar.



## SKINNER AIR CYLINDERS

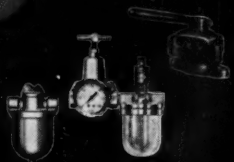
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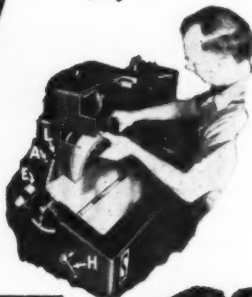
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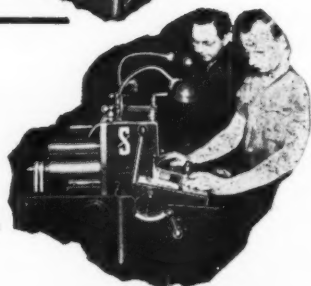
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(Right) Operating view of 10 TD shows ample room to comfortably serve two operators. (Twin lights are optional.) Complete operator comfort when grinding wet. Absolutely no spray or splash.



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## **New metal treating process speeds cold working, cold extrusion of steel**

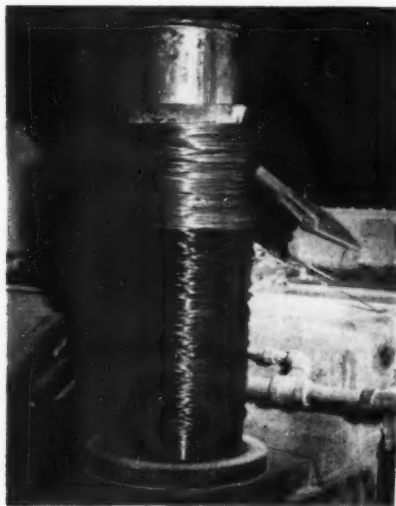
A NEW metal treating chemical process which greatly extends lubrication limits in the cold working of steel has been announced by the Pennsylvania Salt Mfg. Co.

Designated as the Pennsalt Foscoat Process, it consists of compatible cleaning, pickling and application of a new phosphate coating and specially developed lubricants to steel. A heat-resistant lubricating surface is produced which is chemically interlocked with the steel and, therefore, possesses

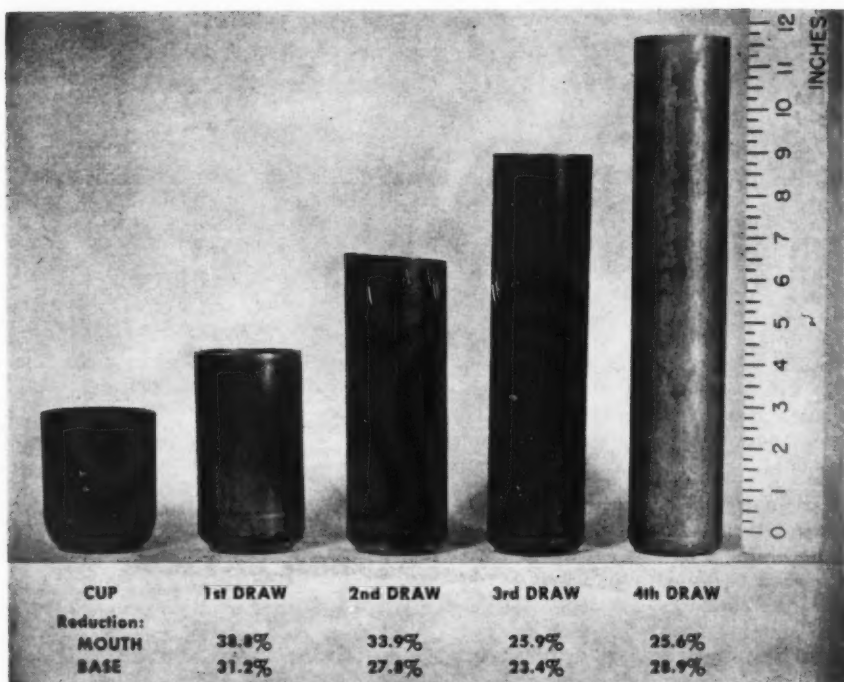
exceptional adherence even under the most severe working conditions.

The new phosphate coating chemical bath was developed by researchers of the Heintz Mfg. Co. of Philadelphia. Joint research conducted by Pennsalt and Heintz has resulted in the evolution of the carefully integrated Foscoat metal preparation process.

The efficiency of the Foscoat Process has been successfully demonstrated in cold extrusion and therefore brings this fabricating technique one step



**1. Surface finish obtained in a large wire mill . . .** using Foscoat Process lubrication, as compared with former conventional lime practice. The uniform, dark colored, scratch-free surface is vastly superior to the shiny, non-uniform scratched surface resulting from use of lime. Moreover, the Foscoated wire is drawn at speeds resulting in a 40 per cent increase in production rate. Despite this speed-up, die life has been increased 2½ times. Foscoated finish is also helpful for subsequent cold heading by improving die life and corrosion resistance, eliminating "blossoming" effect during storage and by permitting closer dimensional tolerances.



**2. Deep drawing (ironing) of a hollow cylindrical steel component . . .** using the new process. The four drawing operations were accomplished from the starting cup with no intermediate annealing and only a single application of the process. Over-all reduction is about 80 percent, which represents a 100 percent increase over conventional methods.

nearer to general commercial use.

The results which have been attained in such applications as tube drawing, wire drawing, deep drawing (ironing), deep stamping, cold heading and similar cold working operations have been remarkable.

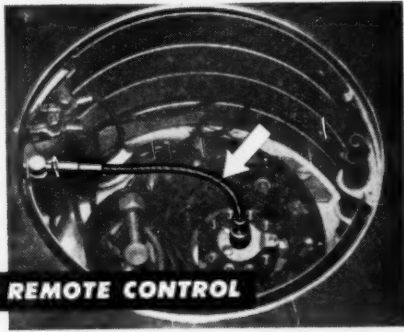
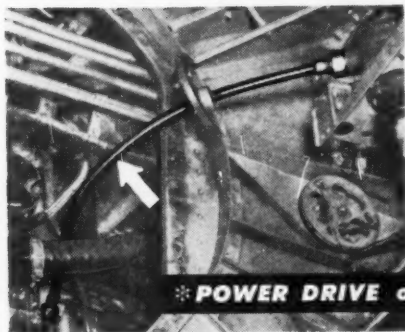
In these operations there generally exist two limitations, lubrication and the ductility of the metal. The former limitation is virtually eliminated by the chemically bonded lubrication film imparted to steel surfaces by the Foscoat Process.

Significant economies resulting from

this improvement in lubrication include elimination of intermediate press operations, as well as annealing and chemical treating operations; additional reduced consumption of chemicals because of compatibility; increased production with existing equipment; savings in metal or reduction in scrap losses, and considerable extension in the life of costly dies.

In wet drawing of fine steel wire, for example, commercial application of the Foscoat Process resulted in a 40 percent increase in the rate of production—actually to the highest rate of capacity of the drawing equipment. Despite this

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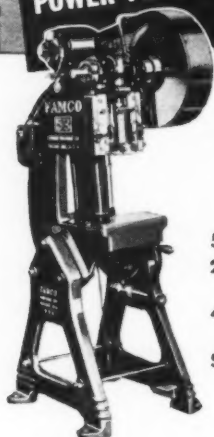
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## famco ANNOUNCES 5 MODELS OF DEEP-THROAT POWER PRESSES . . .



Illustrated: Model 53  
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motor, belt, and  
flywheel guard.

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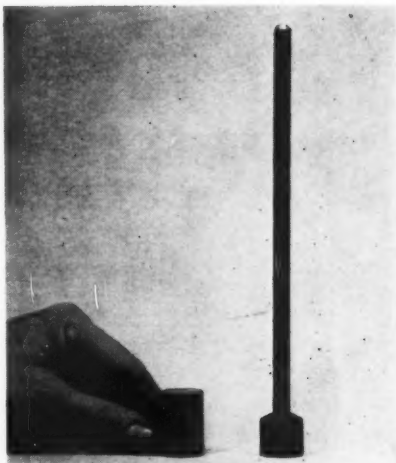
Offering the most models and the highest quality in small presses, Famco now adds five deep-throat, open-back, inclinable models to its line of power presses. This provides 12 sturdy production-type models with versatility and range of capacities (3 to 8 Tons) suitable for any small press application. Check the features below, then see the Famco line at your nearest Distributor's. Write for new Catalog.

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- **PRECISION MACHINED**—Given the extra care in manufacture which has made Famco famous.

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ARBOR PRESSES • AIR PRESSES • DRILL PRESSES  
METAL CUT-OFF SAWS • SQUARING SHEARS  
POWER PRESSES • FOOT PRESSES



**3. Typical example of forward cold extrusion . . .** The startling billet, shown at left, is transformed to the elongated form with a single press operation. Reduction in cross-sectional area is about 85 percent, which is not the limit of reduction possible.

speed-up, die life was increased 2½ times. In dry drawing of steel wire shapes, such as triangle and square wire, from round stock, one application of the Foscoat Process permitted drawing to finished shape without the intermediate anneals and recoating required in previous processes.

Production use of the Foscoat Process at Heintz Mfg. Co. has made possible substantial economies in the fabrication of automatic washing machine tubs. Reductions in scrap losses due to rejects and in down-time for stoning of dies have resulted in an increase of 140 percent in output.

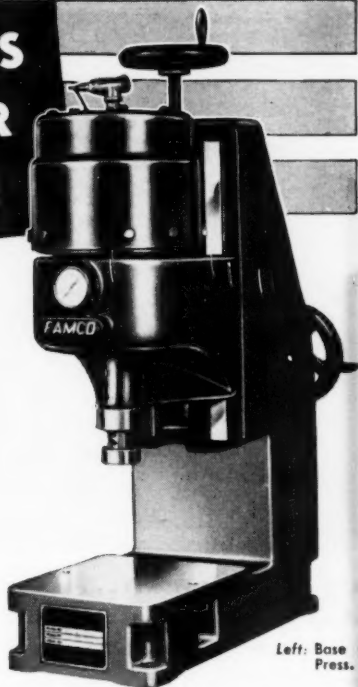
In deep drawing (ironing) of steel cartridge cases, 80 percent reductions in wall thickness in the metal were possible with a single application of the

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- Accurate, built-in pressure gauge.



Left: Base Press.

- Ram keyed to prevent rotating.
- Infinitely variable vertical adjustment of cylinder.

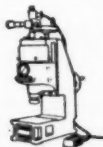
## OTHER MODELS AVAILABLE WITH CHOICE OF CONTROLS



Left: Single Air Control Type.



Right: Dual Air Control Type.



Left: Single Electronic Control Type.



Right: Dual Electronic Control Type.

For further details on the line, write for new Famco Air Press Catalog.

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CUTTING **machines**

**ARBOR PRESSES • DRILL PRESSES • BAND SAWS • AIR PRESSES  
POWER PRESSES • FOOT PRESSES • SQUARING SHEARS**



**4. Use of Foscoat Process . . .** in deep drawing stamping at Heintz Manufacturing Co. is shown by this two-step press operation in production of an automatic washing machine tub. Reduction in scrap loss and in downtime for stoning of dies has resulted in a 140 percent increase in production rate.

Foscoat Process without intermediate annealing. This represents a 100 percent improvement over conventional practice.

In actual production in rod-pulled tube drawing, over-all reductions of 80 percent were achieved with a single application of the Foscoat Process, or about 60 percent improvement over that previously obtained. In another tube mill, using plug drawing, over-all reductions of 60 percent were obtained with one application of Foscoat, which is also a 60 percent increase over existing practice.

It is claimed that even more drastic savings are in prospect in commercial cold extrusion, for it can often eliminate the necessity for forging or upsetting

of heated billets. These operations generally require a starting billet twice the size of that necessary for cold extrusion. The forged shape usually requires extensive scrap-generating machining.

Also, savings are possible by adapting plain carbon steel for applications ordinarily requiring steels containing critical and expensive alloying materials. Cold extrusion involves the concept of steel as a plastic material which, when the barriers of friction are sufficiently extended, will flow under pressure. Stressing the steel in compression—in contrast to cold drawing where forming is performed by stressing the metal in tension—permits a drastic kneading action that increases strength characteristics considerably,



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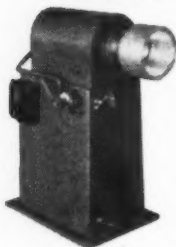
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# SCHAUER

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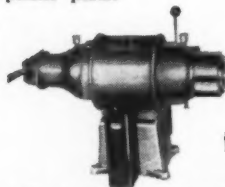
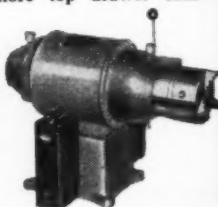
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with but slight effect on ductility.

Cold extrusion, made possible by improvements and modifications to phosphate coating techniques, was developed and used in Germany during World War II, principally as a steel-saving device, to produce cartridge cases, other ammunition components, gun barrels, airplane parts and other tubular or cylindrical bodies.

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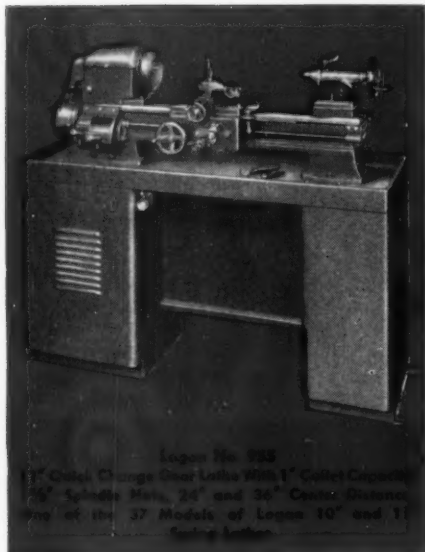


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## THESE LOGAN CHARACTERISTICS WILL HELP YOUR PRODUCTION

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With 1" collet capacity, 11" swing, 1 $\frac{1}{4}$ " spindle hole and center distances of 24" and 36", Logan Lathes have the size to handle substantial work.

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Less than .0005" spindle runout 12" from the bearing . . . two V-ways and two flat ways precision ground to within .0005" variation . . . these are typical Logan Lathe construction tolerances.

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With its ball bearing mounted spindle, its self-lubricating bronze bearings at vital wear points, and its rugged overall construction, the Logan Lathe retains its accuracy and dependability under constant use.

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By reducing power costs; by saving vital floor space; by quick, easy set-ups; by lasting accuracy and low maintenance; Logan Lathes put many metal turning operations on an economical and profitable basis. The saving to be realized on your original investment in Logan Lathes is a further economy well worth considering.

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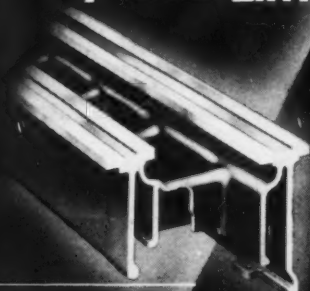
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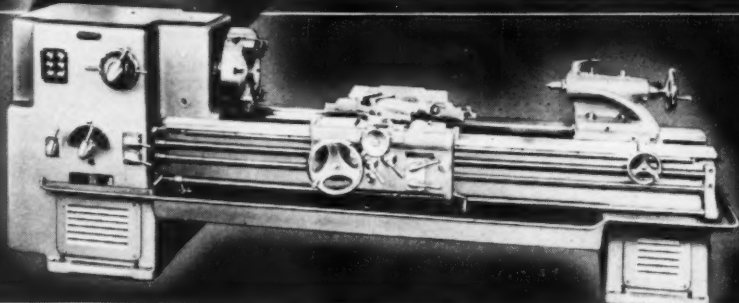
... Webster's Dictionary

Rigid four-wall bed construction with double cross girts spaced at 12" intervals. Casting is of semi-steel nickel mixture for close grain structure.

Sidney's totally enclosed dial controlled gear box provides 60 changes of threads and feeds. All moving parts run constantly in oil.



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*Builders of Precision Machinery Since 1904*



## Foremanship Forum

### **Selection, training and supervision of foremen and supervisors**

by Edmund Mottershead

IN A RECENT series of articles a national weekly trade journal, reported the findings of a survey of the thinking of 2500 supervisors and foremen. Results indicated that foremen felt a "lack of recognition"—were hard put to figure out just where they fit in the management-labor picture. What foremen actually meant when they said they were "neglected" was that the real potentialities and importance of their position was neglected by management.

Foremen are key-men in labor relations. They are critical employees in the field of manufacturing costs and savings. They have responsibilities for production and an opportunity to contribute better methods. They have a task of real leadership. And it is management's responsibility to take the initiative in developing foremen and supervisors to the level of ability and performance where proper "recognition" might be justified.

#### **Look before you hire— or promote**

Top management reports indicate that it costs upwards of \$1,000 to hire a man from the outside—and then lose him after discovering he can't cut the buck as a foreman. It costs far more to raise a man from the ranks to supervisory capacity and later discover he lacks executive and leadership qualities. And hidden in both situations are the excess scrap, bad feelings and roiled tempers from sundry mix-ups and confusions brought about by having the wrong man in the key supervisory or foreman's job. Picking the right man at the outset cuts these costs where they really count!

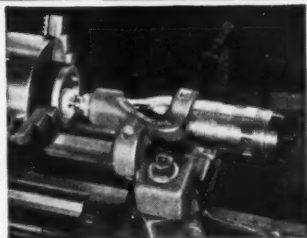
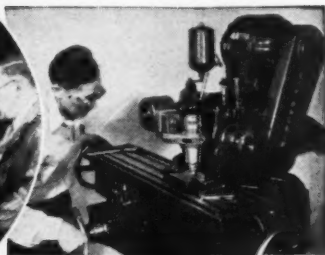
Who are your successful foremen? What characteristics and abilities do they have that you should look for when picking a man for a supervisory job? First of all, look for men who

# ACCURACY TO .0001"

## FOR TOOL ROOM AND PRODUCTION

FOR LESS THAN  
**\$150**

IN PRECISE MOUNTS ON LATHES AND OTHER MACHINE TOOLS, PRECISE GRINDER-MILLERS WITH 1/4 H.P. AND SPEEDS FROM 20,000 TO 45,000 R.P.M. DO THE WORK OF SINGLE-PURPOSE MACHINES COSTING 100 TIMES AS MUCH!



**VERSATILITY.** For cylindrical, internal, external and form grinding; for milling with H. S. steel or **tungsten carbide** midget mills; for micro-finishing and polishing. Use on wood, glass, rubber, plastics, or any metal including the hardest alloy steel.

**DURABILITY.** All metal housing, rigid PRECISE quill, lubricant-sealed, micro-precision bearings 1/4 H. P. AC-DC motor (115 volts) is protected by replaceable fusetrans.

**ATTACHABLE COOLFLEX SHAFT** (optional). Quickly attached for bench work and handtool applications. Same speeds, same precision quill as in PRECISE GRINDER-MILLERS.

**PRECISE PRODUCTS CO.,**

*Write* FOR CATALOG  
1341 Clark St., Racine, Wis.

## PRECISE GRINDER-MILLERS

have good health, generally good appearance, good home life. Check for honesty—personal habits of integrity. Ambition is valuable too, as a man who can see an expanding future will work towards it. Basic intelligence, as contrasted with job-knowledge is important. Try using some practical aptitude tests for mental ability, social ability, mechanical ability! Try to find a man with a cheerful personality whom people like readily, and who has the

ability to handle people under pressure.

USE a formal application blank. USE a planned interview with a checklist to be sure you cover all the bases. Check references by telephone or in person—people don't give facts by mail. And sell the newly hired or newly promoted supervisor on the opportunities of his job at the beginning. Careful selection of supervisors for specific traits and abilities rather than simple job knowledge and seniority will solve



# An ABC Demonstration of

Inspection of 9 pieces using conventional plug gage  
Bore Diam. 1.500"; Total Tolerance .001"



4 pieces passed



4 pieces too small



1 piece  
too large

**DuBo**  
Plug Gage  
*Superiority*

## RESULTS of same inspection using DuBo Plug Gage



Of the 4 pieces passed by conventional plug gage above, only 3 are actually within specified limits when inspected with the more sensitive DuBo plug gage.

DuBo reveals piece D (passed above) is too large



Of the 4 rejected as too small by conventional plug gage, E and F are actually within the limit when inspected with DuBo plug gage.



I, rejected by conventional gage as too large, is so verified when inspected with DuBo plug gage.

Of nine pieces inspected, DuBo reclaimed two false rejects and rejected one piece that had been passed by ordinary plug gage inspection. Apply even a fraction of this ratio to a day's production in your own plant and you'll realize the advantage of using DuBo plug gages.

## Don't Let Profits "Fly Out the Window"

You'll actually save money by using this modern plug gage instead of the out-moded cylindrical plug. DuBo keeps down that high cost of parts needlessly rejected or incorrectly passed. It's all in the design. DuBo plugs simply check better because of the spherical principle on which they are based.

Write or phone any questions you have on this vastly better checking device.

\*U.S. and  
Foreign  
Patents  
Granted

**STANDARD GAGE CO., Inc., Poughkeepsie, N.Y.**

# Hanna

AIR AND HYDRAULIC

## Cylinders

AND

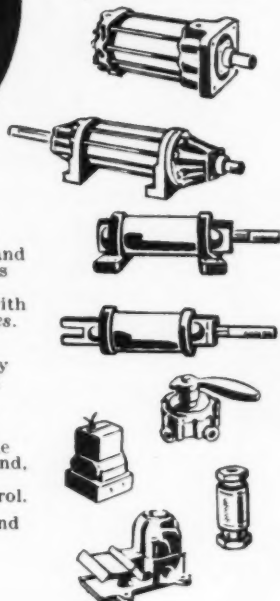
## Valves

*Here's Power  
and Control  
... for 101 uses*

You can speed production, cut costs and simplify the actuation and control of many of your machines and equipment by using the fast, smooth power of Hanna Cylinders with the exacting control of Hanna Valves.

Hanna Cylinders are available in low pressure models operated by air, oil or water up to 250 p.s.i. and in high pressure hydraulic types operating to 1500 p.s.i., in a range of mounting styles to meet all requirements. There is a complete line of Hanna Valves including hand, foot, solenoid and pilot operated, which provide a wide choice of control.

Send for Cylinder catalogs 236 and 233A and Valve Catalog 254.



**Hanna Engineering Works**

HYDRAULIC AND PNEUMATIC EQUIPMENT   CYLINDERS   VALVES   BIVETERS

1754 Elston Avenue, Chicago 22, Illinois

numerous supervisory problems and reduce costs in this area.

### How to train supervisors

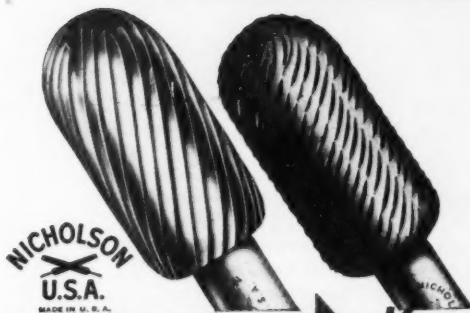
78% of foremen queried stated that their company gave them no specific training in labor relations or in handling personnel problems. Only 14% of foremen stated that they received such training! If management feels that foremen fail to carry out their full responsibility in the area of labor relations, it is

easy to see why many of the men so fail—they simply do not know what to do, how to do it, or why they are doing it, if at all.

### Training means building men.

There is an old law which runs: "Save your pennies, and the dollars will take care of themselves." It might well be reworded for industrial management: "Build your foremen, and production and profits will grow automatically."

## Why Do More Than 100 Leading Firms Use Sentry HARDENING METHODS?



Sentry protects pre-cut keenness of teeth on Nicholson's high speed rotary power tools!

**VERSATILITY.** Sentry Heat Treating Methods are used daily at Nicholson on an almost endless variety of tools.

**REASON**

**Keeness of Teeth  
Maintained!**

The Nicholson File Company in Providence, R.I., tell us that the **SENTRY DIAMOND BLOCK METHOD** of heat treating their high speed rotary power tools (hand cut or precision ground) permits them to do a top quality job and to fully maintain pre-cut keenness of teeth. Further, **SENTRY** gives Nicholson the right heat treating answers on an almost endless variety of sizes and shapes of rotary power and other tools.

Ask for catalog D-5

See you at the Detroit, Michigan Metal Exposition and Congress. We'll be looking for you at Booth No. A-109.

See actual Sentry furnace in operation. Bring samples to be hardened on the spot!

Don't forget the date — October 15-19, 1951



**The Sentry Company**  
INDUSTRIAL ELECTRIC FURNACES AND EQUIPMENT  
FOR HEAT TREATMENT OF METALS  
"Always on Duty" FOXBORO, MASSACHUSETTS



## Do you have a tough clamping job?



Whether you need batteries of clamps (like illustrated) or just one or two—whether you clamp tiny parts or huge assemblies requiring nearly 2 tons pressure, there is a Knu-Vise toggle-action clamp for the job.

All Knu-Vise clamps are made for fast, dependable performance, designed to most exacting specifications, based on exhaustive laboratory tests and years of practical use.

Call on our engineers (without obligation) if you want to know whether your clamping is as efficient as it should be.

Would you like one of our new catalogs?

*Photo Courtesy  
Consolidated Vultee  
Aircraft Corporation*

*Sales Offices in Principal Cities*

**KNU-VISE  
PRODUCTS**

**LAPEER MFG. CO.**  
**3052 DAVISON ROAD • LAPEER, MICHIGAN**

**WESTERN DIVISION: 422 Magnolia Street, Glendale, California**

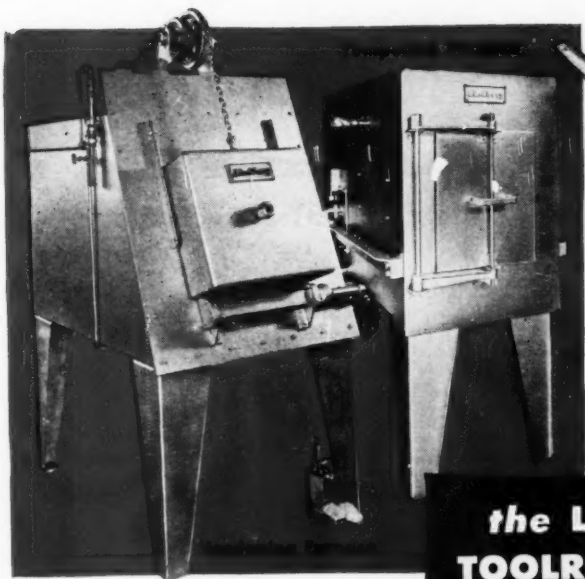
The factory manager or owner who says: "Good men don't need to be trained," is like the little boy who objects to a bath by saying, "I'm clean anyway, Ma." It has been demonstrated that training, in its true sense, is necessary for ALL foremen and supervisors on a continuing basis as long as they work for you.

Such training means more than just training in labor relations or job knowledge. It involves training in leadership

abilities, in executive tasks, in making decisions, in watching and controlling costs, in developing methods, in carrying out responsibility, in communicating management thinking to the working force, and labor thinking to management.

### **Plan what to train your supervisors.**

Your primary task is to develop in supervisors a positive attitude towards their work, their product, their com-



## BASIC FOR EVERY TOOLROOM

### the LINDBERG TOOLROOM TEAM

When production depends on tools and dies, tools and dies depend on the LINDBERG TOOLROOM TEAM—a basic requirement in every toolroom—a must where you want the ultimate in tools and dies which will keep your production rate up and your machinery running with a minimum of tool and die failure. THE LINDBERG TOOLROOM TEAM gives you the precision heat treating which your precision tools and dies need for lasting performance.

**LINDBERG HARDENING FURNACE** — eliminates finishing due to scale and decarb with simple accurate atmosphere control.

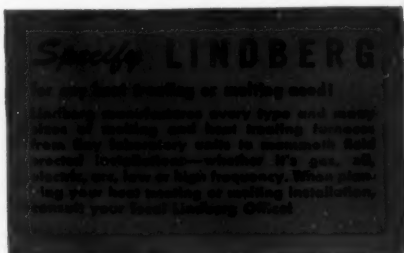
**LINDBERG TEMPERING FURNACE** — allows you to obtain the exact "Rockwell Hardness" required for each specific tool or die.

*For tools and dies requiring high speed tool steel—investigate the Lindberg "L" Type combination preheat—high heat Furnace.*

## LINDBERG FURNACES



**LINDBERG ENGINEERING COMPANY**  
2442 W. Hubbard Street, Chicago 12, Illinois





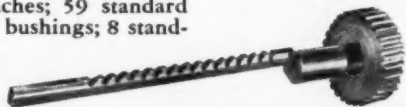
## with du MONT standard KEYWAY BROACH KITS

Cut 'em any width from  $\frac{1}{16}$ " to 1" in any bore from  $\frac{1}{4}$ " to 3"—in gears, cutters, pulley hubs, collars, couplings, etc. Do the work in 60 seconds.

du Mont makes 21 standard sets; 23 standard sizes of broaches; 59 standard sizes of bushings; 8 stand-

ard sets of Metric keyways and broaches; plus a wide range of special production type guideless broaches.

There is a time and money saving du Mont Keyway Broach or Kit to fit your needs.



### MAIL THE COUPON for the facts

The du MONT CORPORATION, Greenfield, Mass.

Please mail descriptive folder and price list T on  
*Minute Man Keyway Broaches and Kits.*

Name .....

Company .....

Address .....

pany, their workers. Next, instill a thorough knowledge of jobs, materials, processes; and methods, knowledge of company policies and business conditions. Follow this with development of skills in handling people, in planning and laying out the work, in carrying out responsibilities as an executive. Finally plan to develop in supervisors work habits of organizing their time, of self improvement and teamwork.

### Plan HOW to train your foremen and supervisors.

Train your men in "small doses." Don't try to cram them full of new ideas and new skills all at once. Plan either formal training meetings or early morning "bull sessions." Allow for plenty of follow-through and personal coaching by a top management man. Set up a definite program and stick to it.





## POP'S School of Filing



**DON'T** throw files on top of one-another (scuffs, blunts and chips teeth)

**DO** keep files separated (in racks)

**DON'T** let files rust (corrodes and dulls teeth)

**DON'T** let files become clogged with dirt or filings

**DO** tap file frequently (on wood) to loosen chips; also clean with file brush or "card"

**DON'T** put too much pressure on forward file stroke

**DON'T** drag file back under needless pressure

**DO** use the right file for the job

**DO** use good, long-lasting files....

NICHOLSON  
U.S.A.

NICHOLSON  
U.S.A.

Many a long-headed foreman is often unjustly regarded as "just an old fuss-button." But in shops where files are an important item in the tool budget, abuses and misuses can run production costs ragged with waste.

The waste isn't in the excessive consumption of files alone. Where it really hurts is in the solar plexus of production

costs: labor—from losses due to file neglects and waste in workmen's time.

With steel conservation and greater production the order of the day, the selection of longer-lasting Nicholson or Black Diamond files serves both those ends. Taking care of files and always using *The right file for the job* effect further economies. Let your industrial distributor help you.

**HOW TO SELECT, USE AND CARE FOR FILES** is helpfully expounded in Nicholson's famous 48-page illustrated book, "*File Philosophy*." Write for as many FREE copies as you can use.

NICHOLSON  
U.S.A.

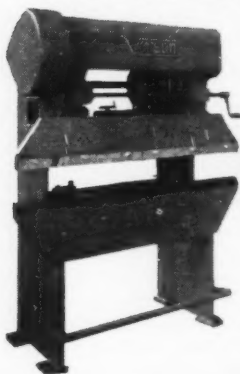
NICHOLSON FILE CO. • 16 Acorn St., Providence 1, R. I.  
(In Canada, Port Hope, Ont.)

BLACK DIAMOND  
TRADE MARK

# NICHOLSON

a file for every purpose

# Slash metal forming costs..



Shops that are wasting manpower with hand brakes or tying up big machines with small odd jobs have the answer to their problems in the new Verson 16-48 Press Brake. Compact and low in cost, the 16-48 brings the advantages of power operation and big brake design to smaller shops. Bed and ram length is 48". Capacity ranges from a 48" length of 16 ga. steel to a 24" length of 10 ga. steel. Allsteel construction assures perfect alignment and maximum rigidity. Write for a copy of Bulletin 16-48A; it gives complete design details, specifications and capacities.

## VERSON ALLSTEEL PRESS CO.

9303 So. Kenwood Ave.  
CHICAGO 19, ILLINOIS

So. Lamar at Ledbetter Dr.  
DALLAS 8, TEXAS

THERE'S A VERNON PRESS BRAKE FOR EVERY JOB

FROM 15 TONS UP!

• Visit Our Booth at the National Metal Show •

Start by selling the new foreman on the importance and opportunity of his job. Plan the training methods to use on each man. Plan to give him encouragement and show him his improvement. Allow for follow-through and re-teaching as needed. And—provide incentives to stimulate learning and effective performance as the new supervisor or foreman continues to gain in skill.

### How to supervise your supervisors

In the opinion of more than 2500 foremen who replied to LEATHER & SHOE'S survey, the most important things that can be done to create better teamwork between foreman and top management include better communications—more information for foremen; more respect for and confidence placed in the foreman; making him feel he is

H. D. BLOCKS  
and FIXTURES

STANDARD STEEL  
BLOCKS

CARBLOX CARBIDE

ANGLE BLOCKS

**Prompt Delivery**

For years Webber has dedicated itself to the production of gage blocks at a price that even the smallest shop can afford. Quality and precision have not been compromised in this undertaking. Ask those who use them. Write for literature.

**Webber**  
GAGE COMPANY  
12905 TRISKETT ROAD  
CLEVELAND 11, OHIO

LARGEST EXCLUSIVE MANUFACTURER OF PRECISION GAGE BLOCKS

really a part of the management team; giving him sufficient authority to carry out his responsibilities; giving him recognition; and being honest with him.

Supervision of foremen and supervisors is the highest task and greatest responsibility of industrial management. **Long-range supervision**

When queried on this point, one industrial executive recently stated that he felt that foremen and supervisors

were either cut out for the jobs or not. They either found supervision a challenging and interesting job, or flubbed it rapidly. He then went on to say that he felt that the foreman's interest in the business must be created and fostered by top management to prevent monotony and maintain enthusiasm.

The key to good supervision by top management, over foremen and supervisors, is to set up clear standards

Your Entire Stock of Drills...

Seen  
at a  
glance



## HUOT DRILL DISPENSER

for

• TOOL CRIBS • STOCK ROOMS • MACHINE SHOPS



**Saves Time** hunting through stacks of packaged drills. Compartments hold a gross of small sizes—a dozen or more of the larger ones. Raised letters on easy sliding drawers . . . hammerlin gray baked enamel finish . . . 14½" x 7¼" x 7¼".

Write  
for  
Circular

Model No. 1: Fractional drills ¼" to ½"  
Model No. 2: Number drills 1 to 60  
Model No. 3: Letter drills A to Z

**HUOT MFG. CO.**

**563 NORTH WHEELER  
ST. PAUL 5, MINNESOTA**

of what constitutes good supervisory performance in the department, standards which every foreman can easily understand—and then show him from day to day or week to week how he is meeting those standards.

These standards may include all of the factors in his job from a job analysis, or may be expressed by analysis of production. The important thing is to make it simple and easily applied.

Keep your foremen informed. Explain any new policies, new programs or methods. Maintain enough close personal contact with them to keep in touch with what they are really thinking. Give them some incentives and encouragement. Recognition for good work is as important as increased earnings—usually more important.

Give him plenty of support. Make him feel that he has strong backing

Chuck guard for safety  
and spindle protection.

Sealed spindle bearing  
for long life.

Stub-tooth gear train  
for sturdiness and long  
life.

Cleco air motor for  
more power, speed  
under load and long  
life.

Lubricator in handle  
gives positive lubrication  
for long life and  
low maintenance.



**...drills more holes faster  
at a lower over-all cost!**

This Cleco air-operated drill answers the need for a more powerful, longer-life drill that is easy to handle in close quarters.

The 9DBW-28A sets a new standard for drill performance. It was accepted as standard by one of the nations largest aircraft manufacturers after exhaustive tests, and it cuts production costs wherever it is used.

But this tool is only one of a complete line of Cleco Air Tools. Call, write or wire us and a Cleco Field Engineer will be glad to help you solve some of your production problems.

SPECIFICATIONS FOR THE

**CLECO**  
9DBW-28A

Length over-all..... 5 1/2"  
Distance side to  
center of spindle..... 12 1/8"  
Standard equipment... 1/4" Chuck  
Drilling capacity..... 3/8" Holes  
R. P. M..... 2800  
Weight..... 2 1/2 Lbs.  
Throttle handle..... Pistol grip

Straight handle optional.  
Angle attachments available.

2849



**CLECO DIVISION**



of the REED ROLLER BIT COMPANY • 5125 Clinton Drive, Houston 20, Texas

from the rest of the management team—to which he belongs. Feed him new ideas, management information. Watch his performance in specific factors which are easily measured so that you can help him spot weak points in his own supervisory performance and correct them. Spend some time with him in individual counselling on your part, to help him with special problems and

to get better acquainted with him personally.

And, let him know that you are more interested in HIM than you are in his immediate production record . . . that you are interested in increasing his executive ability and productive capacity. YOUR increased production and reduced costs will take care of themselves!

## HOW TO PICK GOOD SUPERVISORS

### CHECK THESE 8 SIMPLE TESTS:

OK

1. **COUNT THE COST!** It costs from \$1,000 to 3,000 to hire (and lose) a man hired from outside for supervisory work. It costs at least that much to upgrade a man from the ranks—and many times more to pick the wrong man! \_\_\_\_\_
2. **STUDY YOUR SUCCESSFUL SUPERVISORS:** What qualities do they have and use that you should look for in selecting a supervisor or lead-man? \_\_\_\_\_
  - A. **Good health**—to do a full day's work every day. \_\_\_\_\_
  - B. **Good appearance**—clean, shaved, neat, orderly. \_\_\_\_\_
  - C. **Good home life**—a happy home makes a "happy" man. \_\_\_\_\_
  - D. **Honesty, sobriety**—personal integrity, good habits, reliability. \_\_\_\_\_
  - E. **Ambition**—sufficient "drive" to get ahead. \_\_\_\_\_
  - F. **Intelligence**—ability to learn his job and do it better. \_\_\_\_\_
  - G. **Mechanical ability**—to understand, maintain, and teach equipment. \_\_\_\_\_
  - H. **Personality**—cheerful, likeable, courteous. \_\_\_\_\_
  - I. **Ability to handle people**—tact, diplomacy, firmness. \_\_\_\_\_
  - J. **Ability** to plan and organize. \_\_\_\_\_
  - K. **Judgment** and decision. \_\_\_\_\_
  - L. **Job knowledge**—control of operations and costs. \_\_\_\_\_
  - M. **Others** you find necessary: \_\_\_\_\_
3. **STUDY YOUR FAILURES:** What qualities did they have that you want to look for and AVOID in future supervisors?
 

A. Poor health	D. Doubtful honesty
B. Domestic difficulties	E. Insufficient job knowledge
C. Too much "education"	F. Can't take responsibility
	Others: _____
4. **USE** an application blank that covers all the bases and reveals the facts. \_\_\_\_\_
5. **PLAN** your interview before placement—use an outline and follow it! \_\_\_\_\_
6. **CHECK REFERENCES** in person—or at least by telephone. Not by mail. \_\_\_\_\_
7. **TRY** practical aptitude tests of intelligence, mechanical ability. \_\_\_\_\_
8. **SELL** him the opportunities on the job. Develop interest at the start. \_\_\_\_\_



*Remember!*

**ALLEN  
COLLETS**



Can be depended on for the Best Performance, Extreme Accuracy, Concentricity, Longer Life.



WE WILL DUPLICATE  
COLLETS,  
COLLET TUBES,  
PUSHERS AND  
PUSHER TUBES

**MAIL COUPON TODAY!**

**ALLEN COLLET MFG. CO., INC.**  
17720 Claran Ave.  
Melvindale, Michigan

Please send catalog and prices.

NAME .....  
TITLE .....  
COMPANY .....  
STREET NO. ....  
CITY ..... ZONE .. STATE .....

## HOW TO TRAIN AND UPGRADE SUPERVISORS

### CHECK THESE 5 SIMPLE STEPS:

OK

1. **SET UP YOUR TARGET:** our job is building men—not just production. \_\_\_\_\_

2. **PLAN** what to teach your men: \_\_\_\_\_

- A. **Attitudes:** Develop a positive, enthusiastic attitude towards his job, his company, and products, his fellow employees. Develop a willingness to go out of his way to cooperate. Instill ambition. \_\_\_\_\_
- B. **Knowledge:** Expect a thorough knowledge of all machines, materials, methods, and jobs in his department. Train him to impart knowledge, manage his department, make decisions and accept and carry out responsibility. \_\_\_\_\_
- C. **Skills:** Help him develop skills in dealing with people, skills in planning the work, in meeting difficulties, in expediting production, in developing methods. \_\_\_\_\_
- D. **Work habits:** Guide him in developing work habits of self discipline and self improvement; help him organize his use of his productive time; develop habits of teamwork with the rest of the organization. \_\_\_\_\_

### 3. PLAN HOW TO TEACH YOUR SUPERVISORS:

- A. In "small doses"—don't cram them too much at once. \_\_\_\_\_
- B. With semi-formal "training classes"—once a week, 1 hour or so. \_\_\_\_\_
- C. With informal "morning bull sessions"—10 minutes a day. \_\_\_\_\_
- D. With personal coaching—individual conferences on problems. \_\_\_\_\_
- E. Work with a definite training or probation period. \_\_\_\_\_

### 4. SET UP A DEFINITE PROGRAM:

- A. **Sell** the importance and opportunity of the job at the beginning—show him how he can make progress and see it. \_\_\_\_\_
- B. **Plan** definite training "methods"—good teaching means thorough explanation, demonstration, check and question each step. \_\_\_\_\_
- C. **Plan** to give him encouragement as he shows improvement. \_\_\_\_\_
- D. **Plan** for follow through to see if he is making the grade. Allow for additional coaching to re-explain, correct errors, etc. \_\_\_\_\_

5. **PROVIDE** incentives to stimulate learning and better supervisory performance. \_\_\_\_\_

## HOW TO SUPERVISE YOUR SUPERVISORS

### CHECK THESE BASIC POINTS:

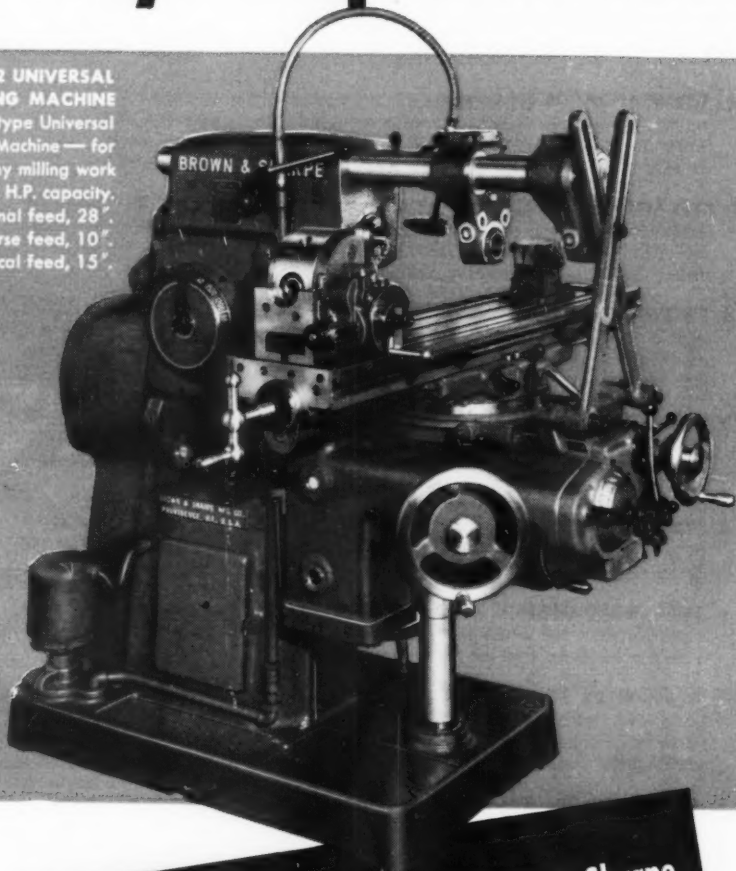
OK

1. **SET STANDARDS** for supervisory job performance; develop a check-list or merit-rating sheet to rate your supervisors' performance, either on the basis of a job analysis of all the factors of his job, or on the basis of key elements or results such percent of scrap, production, etc. \_\_\_\_\_
2. **EXPLAIN CAREFULLY** any new policies or programs. Be sure he understands and is enthusiastic. Question and check his understanding. Maintain enough personal contact with him to be close to what he is really thinking and feeling about things in the organization. \_\_\_\_\_
3. **PROVIDE INCENTIVES AND ENCOURAGEMENT.** Try an occasional contest or competitive device, but be sure to equalize all the factors in the situation for fairness like any good handicapper. Provide that necessary pat on the back for good work and conscientious efforts. \_\_\_\_\_
4. **GIVE HIM SUPPORT.** Feed him new ideas, new methods, management thinking. Back him up with good engineering, good equipment, good sources of raw materials, as good workers as can be hired. Provide him with a basically sound "deal" in which to operate. \_\_\_\_\_
5. **TEST PERFORMANCE** on production—give him a goal or quota to shoot at and make it one he can accomplish with the men and machines at his command—or surpass with a little extra effort. \_\_\_\_\_
6. **TEST PERFORMANCE** on costs—keep records of scrap, overtime work needed, machine down-time, rework, and other key cost factors. Show him the facts so that he can spot the weak points in his performance. \_\_\_\_\_
7. **FOLLOW UP PERSONALLY.** Go out into the department with him and help him with specific job problems. Take time to have individual personal "counseling" interviews with each supervisor periodically to check over individual problems they may have. \_\_\_\_\_
8. **SHOW HIM HIS PROGRESS**—so he can see it in terms of increased earning. \_\_\_\_\_
9. **BE ALERT** to his attitudes and habits while you are upgrading his job knowledge and job skills as a supervisor. The "best" supervisor you have may possess only mediocre "ability" but a terrific attitude. \_\_\_\_\_
10. **HE IS IMPORTANT** to you—let him know that he, personally, is more important to you as a man than the production he is responsible for. You are building MEN first—and producing your product second! Good supervisory leadership can make production almost automatic. \_\_\_\_\_
11. **GIVE HIM RESPONSIBILITY—AND AUTHORITY** to go with it. Any man who is willing to assume full responsibility for an operation needs full authority to handle the problems connected with it. If he prefers to depend on others, he may simply feel he hasn't the authority to do a good job and consequently can't accept the responsibility. \_\_\_\_\_

# Thrifty Preparedness

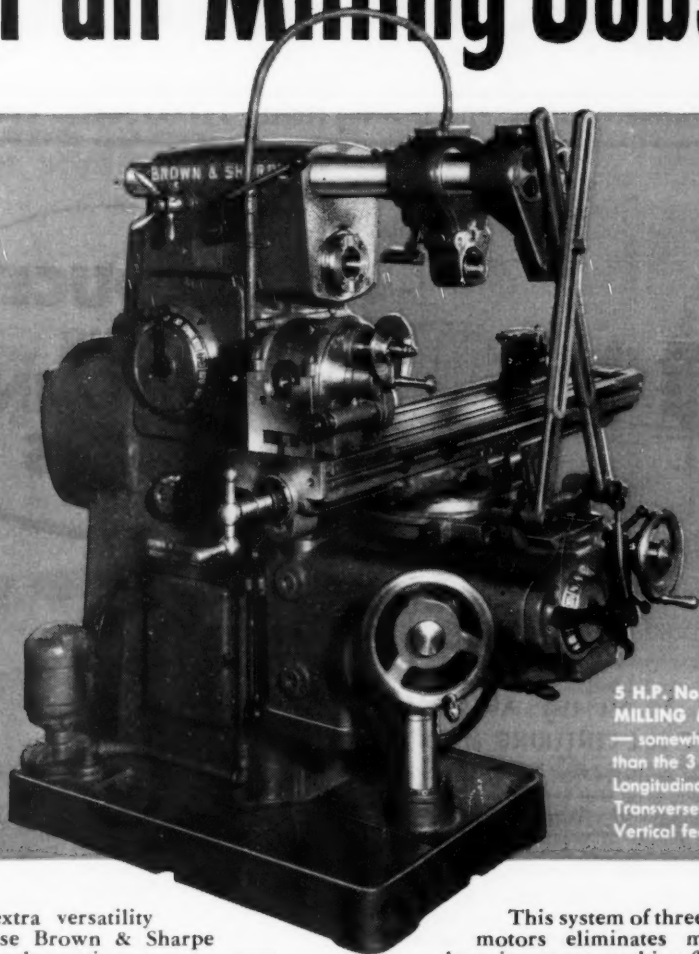
## 3 H.P. No. 2 UNIVERSAL MILLING MACHINE

Light type Universal  
Milling Machine — for  
virtually any milling work  
within 3 H.P. capacity.  
Longitudinal feed, 28".  
Transverse feed, 10".  
Vertical feed, 15".



**Shops equipped with 3 & 5 H.P. Brown & Sharpe  
No. 2 Universal Milling Machines  
have instant capacity  
for unusual as well as ordinary jobs**

# for all Milling Jobs...



**5 H.P. No. 2 UNIVERSAL  
MILLING MACHINE**

— somewhat heavier  
than the 3 H.P.  
Longitudinal feed, 28".  
Transverse feed, 10".  
Vertical feed, 16 1/2".

The extra versatility of these Brown & Sharpe Universals equips you to meet sudden demands for change-overs in milling jobs quickly and easily—prepares you to keep production at a continuously high level in spite of changes in models or products.

With both of these machines, production benefits from the more efficient tri-motor drive—for spindle, table, and coolant.

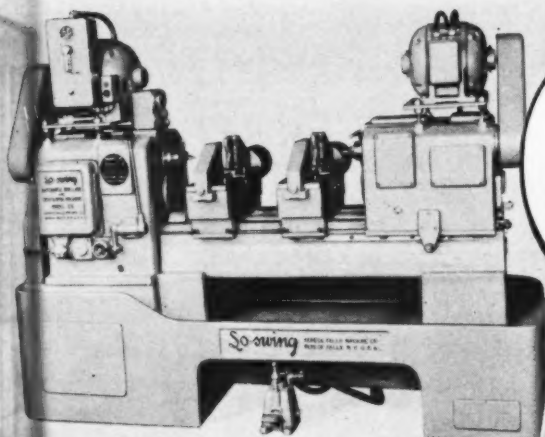
This system of three independent motors eliminates much friction loss, increases machine flexibility, and assures full power at the cutter.

Other production-boosting features include quick selection of speeds and feeds; convenient, time-saving controls; automatic lubrication; and extended spindle face. Write for detailed bulletins. Brown & Sharpe Mfg. Co., Providence 1, R. I., U.S.A.

***Brown & Sharpe*** 

# MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



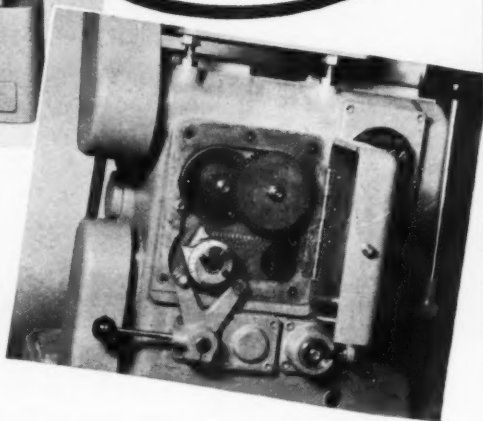
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## WITH A Lo-swing AUTOMATIC DRILLING and CENTERING MACHINE

● The Lo-swing Model "CS" has demonstrated a marked ability to cut costs on both mass production and short-run jobs. Both speeds and feeds can be quickly changed and automatic cycle time held to a strict minimum due to its exclusive HIGH SPEED, ADJUSTABLE RAPID TRAVERSE MECHANISM.

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in pairs. Ample distance from the bed to the spindle provides sufficient room for special work-holding fixtures which are available as extra equipment. ELECTRIC MOTORS ARE THE STANDARD FOOT MOUNTING TYPE and may be furnished in sizes from 1 to 3 H.P.

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**PRODUCTION COSTS ARE LOWER WITH Lo-swing**



**A special report  
by the editors of  
MACHINE and TOOL  
BLUE BOOK**

**Report number 16**

# **Planers**

This is the sixteenth in a monthly series of special reports discussing various types of machine tools. Included in this month's special report on planers:

1. Carbide tools and some case histories on the use of carbides on planer work.
2. Descriptions of late model Planers,
3. Specifications of American-built machines.

Previously published reports discussed: 1. Thread Rolling; 2. Power Press Brakes; 3, 4, 5. Milling machines; 6. Honing, Lapping, and Superfinishing; 7. Automatic Screw machines; 8. MAPI Replacement Formula; 9, 10. Chucking machines, Turret Lathes, Hand Screw machines; 11. Broaching machines; 12. Shapers, Slotters, Keyseaters; 13, 14, 15, Lathes; 16. Planers.

## **Carbide tools and some case histories on the use of carbides on planer work**

by William F. Schleicher

To recommend under what circumstances and on what jobs carbides are to be used is a hazardous undertaking. Too many variables: material, size and nature of workpiece, length of run, type and age of planer, etc., militate against categorical recommendations in an article as short as this one. In spite of much valuable work which the machine tool builders and carbide people have done with the subject, it remains for the individual user to determine whether carbides can be used effective-

ly on a particular planer operation. Yet the user will not be completely in the dark; sufficient data on tools, speeds, feeds, are at hand to serve as guide posts; furthermore, the planer builders and carbide manufacturers have enough intelligent information to offer advice and lend a willing hand.

At the G. A. Gray Company, carbide tools are constantly used to rough plane large components for planers, milling

Table 1

	Approx. Brinell	DEPTH OF CUT										Finish .001-1/64"
		Up to 1/8"		Up to 3/8"		Up to 3/4"		Up to 1"		Feed ""		
		Sp. ft./min.	Feed ""	Sp. ft./min.	Feed ""	Sp. ft./min.	Feed ""	Sp. ft./min.	Feed ""			
CAST IRON medium	175	230	1/16"	180	1/8"	150	3/32"	150	1/16"	230		
CAST IRON hard	230	160	1/16"	130	1/16"	110	1/16"			180		
STEEL mild	130	260	3/32"	220	1/16"	180	1/16"			300		
STEEL average	200	200	3/32"	180	1/16"	150	1/16"			300		
STEEL low machin- ability	270	160	1/16"	130	3/64"					250		
BRONZE soft		*	3/16"	*	5/32"	*	5/32"	*	1/8"	*		
BRONZE hard		*	5/32"	*	1/8"	*	1/8"	*	3/32"	*		
ALUMINUM		*	3/16"	*	5/32"	*	5/32"	*	1/8"	*		
PLASTICS		*	3/16"	*	5/32"	*	5/32"	*	1/8"	*		

\* Use maximum available table speeds

\* Use maximum available table speeds

machines and horizontal boring machines. Heavy, interrupted cuts are common-place and the feeds utilized are substantially the same as though slower, conventional tools were employed. The Gray people advocate trading speed for feed; costs may only be slashed by taking heavy cuts at high speeds.

### General Observations

Table 1 shows the speeds and feeds that are recommended for use with carbides. These figures are based on experience and are not theoretical. Notice that speeds of 260 feet per minute and up can be utilized, depending on working conditions. The chart shows a definite relationship between speeds and feeds; it is important that a proper balance be maintained to that a maximum rate of metal removal consistent with longest tool life may be obtained.

A planer of sufficient power should be available to eliminate stalling the planer during the planing operation.

### Carbide Tools

Many tools have been developed and are commercially available that feature brazed-on tips; these are generally restricted to relatively fine cuts and light duty work. For heavy cutting and large areas best results are obtained with clamped-on tip planer tools which have hardened steel shanks and are of rugged construction. Mechanical clamping of the insert provides an assembly free from brazing strains which permits longer tool life under severe operating conditions.

Carbide planer tool shanks should be made of a good quality of steel which can be heat treated. A shank hardened to a 40-45 Rockwell C will afford more rigid support to the tip with consequent increased tool life. For heavy duty-planing it has been found expedient to insert a hardened steel seat under the tip to minimize the peening action of

# **SANFORD**

## **SURFACE GRINDER**

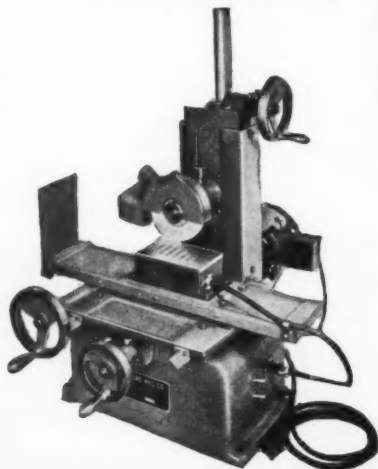
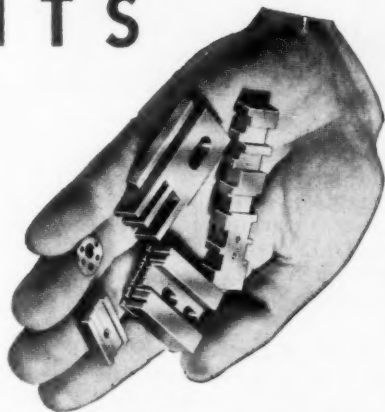
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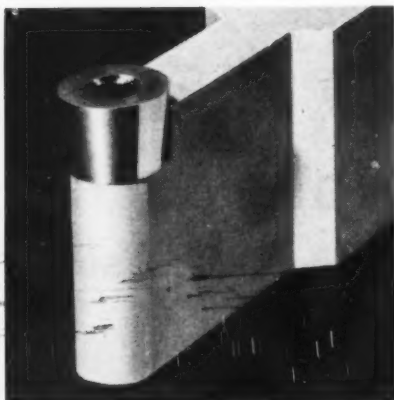


Figure 1

the tip on its seat. This is particularly true for interrupted cuts where a hard, flat carbide tip seat must be maintained. This seat is usually screwed or loosely doweled into position and can be readily removed for trueing-up or replacing when necessary.

#### A Selection of Carbide Tools

The G. A. Gray people, who use carbides on a majority of operations, have developed a number of tools which have given successful service. Some are

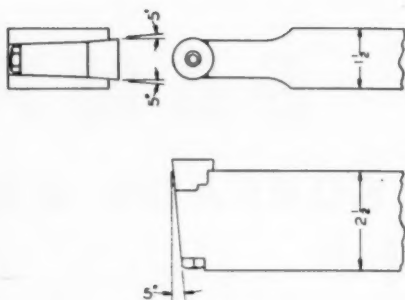


Figure 1

readily available from commercial sources, others can be quite easily made in your own shop.

Figure 1 is an excellent general purpose roughing tool for horizontal cuts with rail head or vertical cuts with side head. Tool pictured is right or left-hand. Similar tools with off-set tips may be desired for either right or left-hand service with more rigid shank design. The carbide tip is ground flat over its top surface producing zero back and side rake for planing cast iron. When dull, the hollow-head socket screw is loosened and tip is revolved slightly to present a new cutting edge. Six or

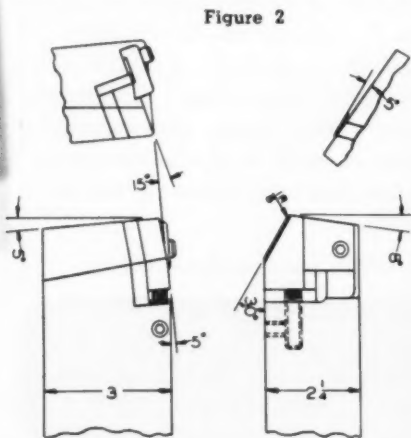
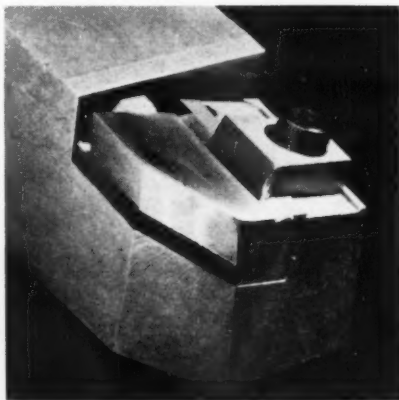
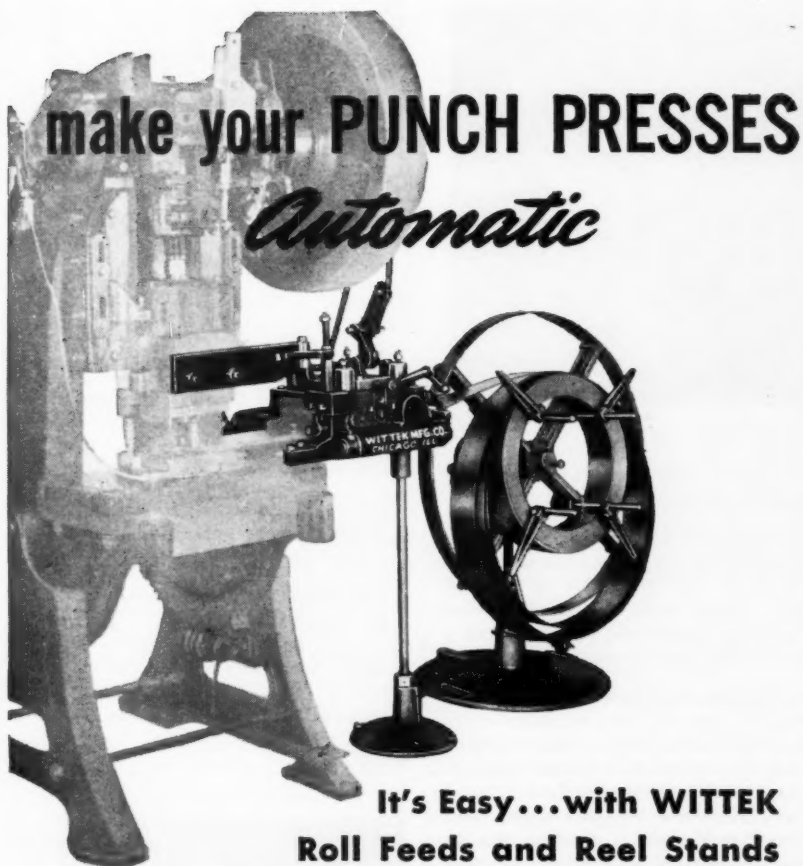


Figure 2

Figure 2





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Wittek Reel Stands facilitate handling coiled stock.

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4321 W. 24th Place, Chicago 23, Illinois





Figure 3

more cutting edges are thus available for each grind.

The shank is milled so as to provide a flat seat for the tip and a back wall that conforms to the tip's slightly tapered contour. Tools with larger diameter tips may be provided with a circular hardened steel seat under the tip.

Modifications of this design have been effectively used for planing hard steel alloy knife blanks. The tip was counter-bored and mounted on a hardened pilot. The face of the tip was hollow-ground and a  $1/32$ " wide negative angle land produced good results. Various grades of steel require modifications of land angle and width.

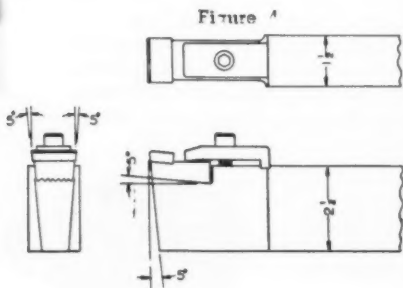


Figure 4

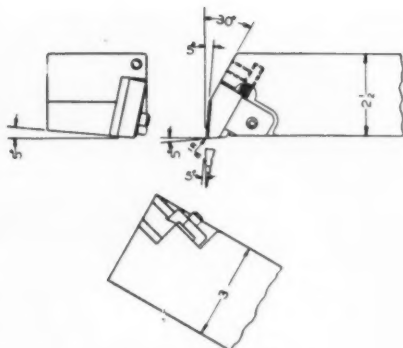


Figure 3

For depth of cut in cast iron up to  $3/8$ ", use tip of 1" diameter. For greater depths, larger diameter tips may be employed.

Figure 2 represents probably the most satisfactory horizontal heavy-duty roughing tool yet developed.

The clipped-on carbide tip rests on a hardened seat. The tip is backed up by a set screw which keeps it from backing away due to the thrust of the cut. The tip is held into position by a substantial mechanical clamp secured to the shank by a hollow head socket screw.

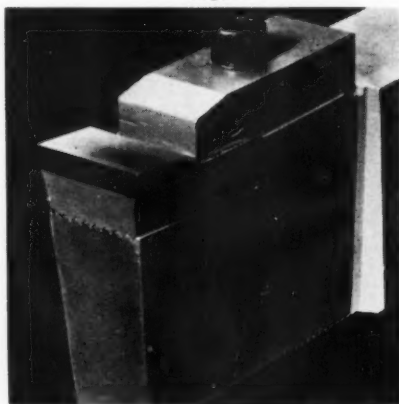


Figure 4



# PERFECT HOLES

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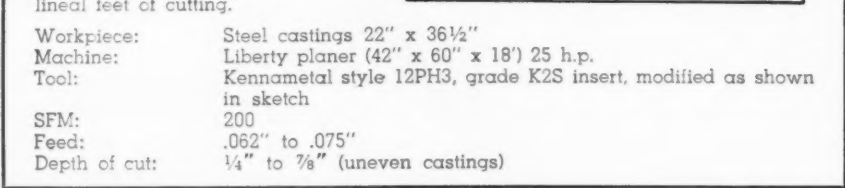
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**SHEARCUT TOOL COMPANY**  
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Dept. BB-101

A number of 22" x 36½" steel castings had to be machined. These were set up five in a row in two rows on a Liberty planer (42" x 60" x 18") which were tooled with carbide planer tool.

Depth of cut varied from 1/4" to 7/8" because of the unevenness of the castings. This severe operating condition caused chipping on the cutting point of the insert. By modifying the cutting edges as shown chipping was eliminated and one row of five castings was machined before any regrinding was necessary. This represents about 4958 lineal feet of cutting.



Steel castings 22" x 36½"

Liberty planer (42" x 60" x 18') 25 h.p.

Kennametal style 12PH3, grade K2S insert, modified as shown in sketch

200

.062" to .075"

$\frac{1}{4}$ " to  $\frac{7}{8}$ " (uneven castings)

This tool may be obtained commercially.

Figure 3 is best suited to heavy-duty down feeds using rail heads. It has been used with great success for roughing the edges of planer tables, for example, where due to the presence of chip removal cored holes at one foot intervals, the service is of an interrupted nature. Cuts  $\frac{3}{4}$ " deep, .090" feed at 150 f.p.m. speed are feasible.

The solid carbide tip is mounted on a hardened seat to minimize the peening action occasioned by heavy-duty interrupted planing. The tip is backed up by a set screw which keeps it from being forced away from the cut. The tip is held in position by the mechanical clamp secured by the hollow-head socket screw.

This type of tool is commercially available.

Figure 4 is excellent for slotting and for second roughing and finishing flat.

horizontal or vertical surfaces. It is of the clamped on bit type with the bottom of the bit serrated. This design permits offsetting the bit to the left or right when the nature of the cut makes such requirements necessary and further provides a rigid lock for the bit.

The bit is held in place by the mechanical clamp which is secured by a hollow head socket screw. Should the tool become dull in service, it is a simple matter to remove same from the holder and insert a new bit. It is not necessary to remove the heavy shank from the apron.

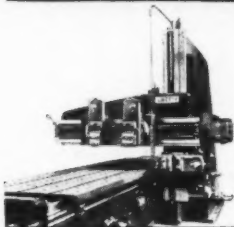
Figure 5 is for heavy duty roughing to a depth that is limited by the size of the tip. Due to the fact that the tip can be removed and rotated to any one of four positions, there are accordingly four cutting edges on each end. Since there are two ends, there is a total of eight cutting edges on the tip before regrinding is necessary.

# LIBERTY

BUILDS

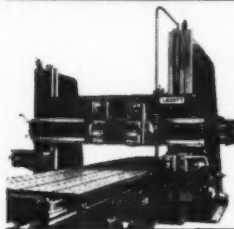
# 3

*great*  
PLANERS



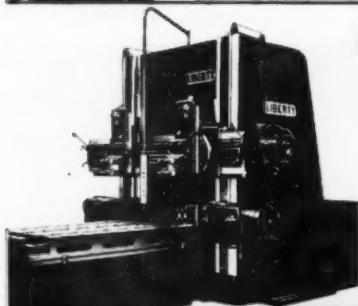
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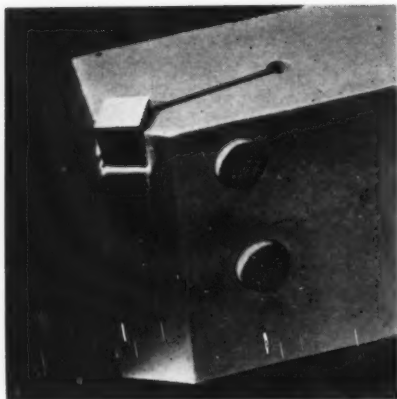


Figure 5

The carbide tip seats on a hardened insert which is securely positioned by a large back-up screw located concentric with the square broached hole.

A modification of this type of tool features a cylindrical tip.

Tools of this type and a variety of sizes are available commercially.

Figure 6 may be made in either the right-hand or left-hand types and has been found to be excellent for roughing and finishing dove-tail or angular surfaces. It is of the clamped-on bit type. The carbide tip is secured to a small bit which is constrained against movement by serrations between the

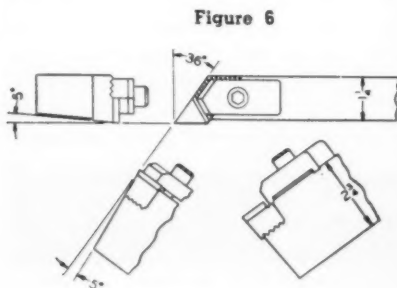


Figure 6

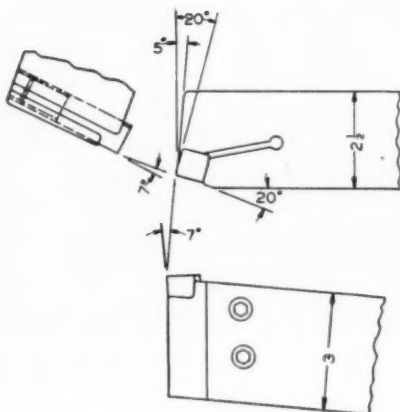
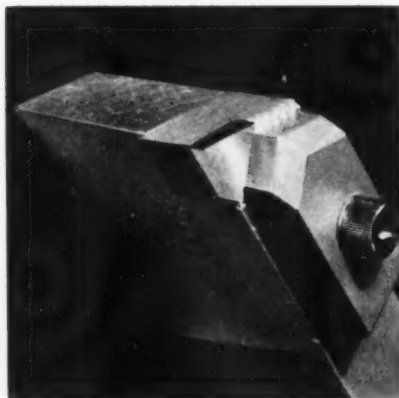


Figure 5

bottom of the bit and the shank seat and additional serrations between the top of the bit and the clamp piece. Should the tip require replacement in the midst of a cutting operation, it is a simple matter to loosen the clamp, remove the bit and replace with a new one, without the need of removing the heavier shank from the apron of the planer.

Figure 7 is designed for medium-duty roughing and finishing of undercuts. It

Figure 6



*In Distinguished Company*

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**OIL-RELIEF  
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VALVES**

Installed by Cincinnati Planer Company to lubricate table ways on planers and planer type milling machines.

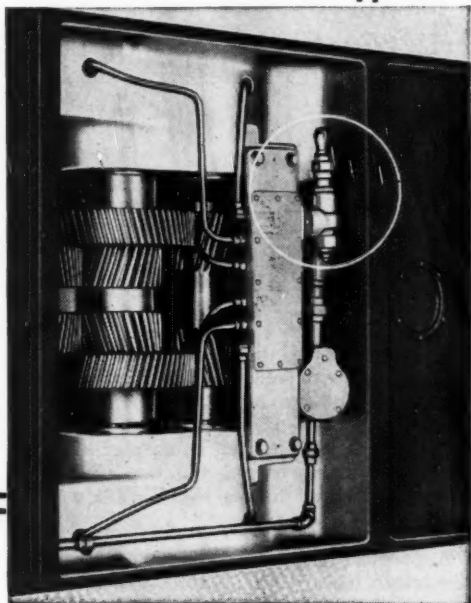
This distinguished company, always proud of its products, uses FULFLO OIL-RELIEF VALVES to assure constant, uniform lubricating pressures.

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THE



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BLANCHESTER, OHIO



**CHATTERLESS...**

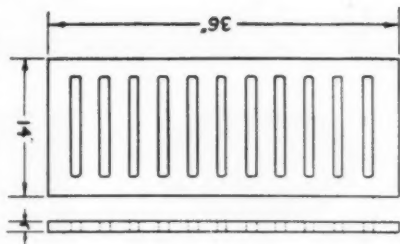
installed quickly with no further maintenance. Pipe sizes:  $\frac{1}{4}$ " to 2" standard pipe thread and STD 300# American Flange Valves 1" to  $2\frac{1}{2}$ ".

## Case history No. 2

An oil company had a tough machining problem in planing 1020 steel, 14" x 36" x 1". Machining was made difficult because of interrupted cutting.

The pieces were laid end to end on the planer table. Each piece had ten cross members, resulting in 12 interruptions, or 36 per stroke of the planer.

Material:	1020 steel
Machine:	Niles; automatic tool lifter and variable speed motor
Operation:	Planing top surface
Speed:	180 s.f.m.
Tool:	Kennametal 12H190, grade K2S
Feed:	.031" per stroke
Depth cut:	1/4"



is of the clamped-on bit type. The bit and its seat are serrated. Vertical as well as in-and-out adjustment is permissible. A back-up screw is provided which keeps the bit from being pushed away by the thrust of the cut. The clamp is secured to the shank with a hollow-head socket screw.

A further refinement of the design illustrated features an additional serra-

ted engagement between the bit and the clamp. These serrations are at right-angles to the ones on the seat.

This design may be readily modified for right-hand or left-hand operation.

Figure 8 was designed for finishing and sizing slots. Due to the split shank and the adjustable tapered set screw, it is possible to adjust the slot width produced without grinding specially to size. Total adjustment of approximately  $\frac{1}{16}$ " is permissible. After this tool has been ground, it is a simple matter to

Figure 7

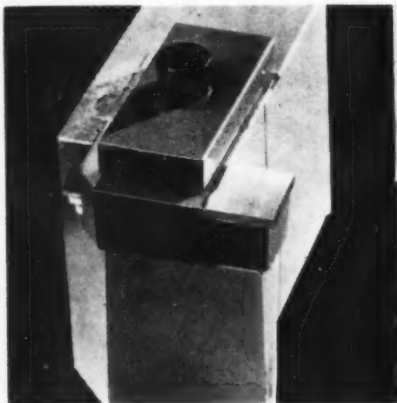
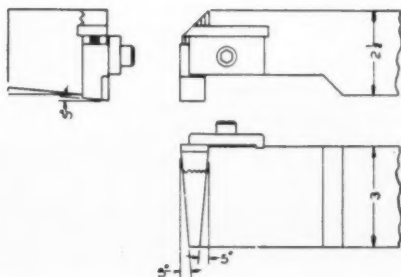


Figure 7





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380, 700, 1200, 2500, 5200 RPM
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TOOL

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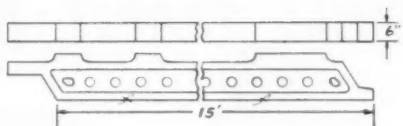
### Case history No. 3

Planing of large cast steel beams was very troublesome with HSS tools because of heavy sand inclusions. Tool wear was rapid, three changes were required to complete one piece. The heat which was developed caused severe distortion of the castings.

Workpiece: Large cast steel beam

Operation: Rough plane bottom surface

Machine: Cincinnati 35 h.p.



### Comparative performance

Tool: HSS

Speed: 28 s.f.m.

Depth:  $\frac{5}{8}$ "

Tool: Carbide. Modified 10°  
NBR .070"-.080" flat land  
1/16" NR

Speed: 110 s.f.m.

Feed: .080"

Depth:  $\frac{5}{8}$ "

It required 1½ hours, including three tool changes to complete one piece with HSS. Carbides produced a complete piece in only 25 minutes with 21 pieces per grind. In addition

to one hour and five minutes savings in production time, there was an additional saving of approximately 30 minutes in tool grinding time. Total saving: 1 hour and 35 minutes.

adjust same to maintain standard sizes. Because the finish slotting operation involves relatively light cuts, it is permissible to successfully utilize a design embracing brazed on carbide tips.

To estimate planing time with carbide tools and with high speed steel tools, the G. A. Gray Co. have devel-

oped a Planer Time Calculator. With this ingenious calculator the time required to plane a given workpiece can

Figure 8

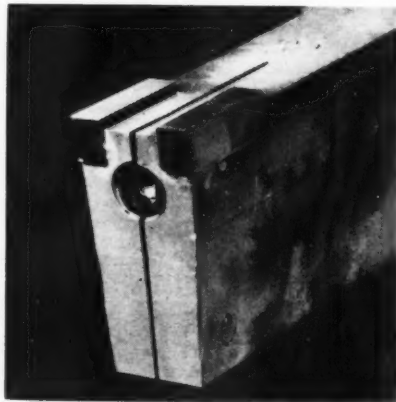
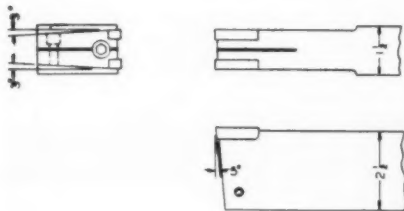
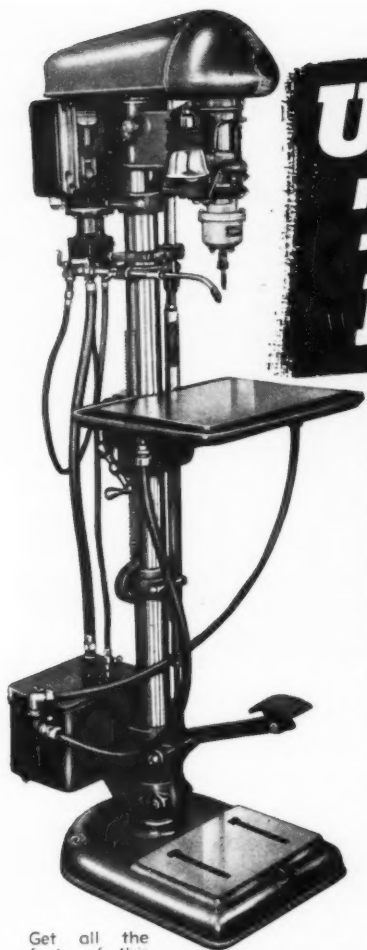


Figure 8





# Universal Tapping Machine

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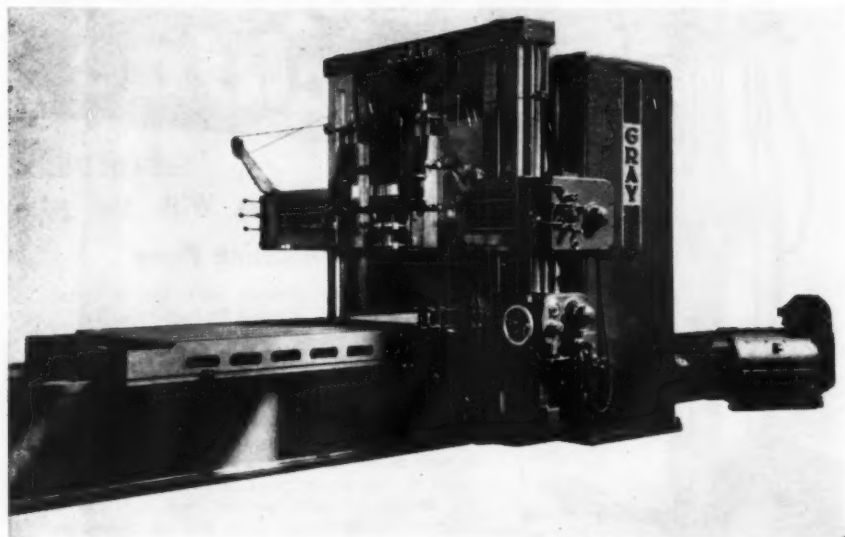
be determined in a matter of seconds. Calculators may be obtained from the G. A. Gray people in Cincinnati.

The author is indebted to Kennametal, Inc., and G. A. Gray Co.,

Cincinnati, O., for permission to use the material and photos and sketches used in this article.

The End

## Part 2. Descriptions of late model Planers



### Gray double housing planers

These planers, made by The G. A. Gray Co., Cincinnati, O., feature non-metallic ways. Laminated plastic plates are secured to the table by laminated plastic pins and are then planed to a smooth, accurate bearing. The ways are lubricated by a system of loop lubrication.

The table is driven by a specially designed system of helical gearing (from first drive shaft to table rack, inclusive), which provides a powerful drive. In the

Gray balanced drive objectionable side thrust is eliminated on the great majority of work, the helical angle having been so designed that the thrust of the bull gear against the rack is equal and opposite to the normal side pressure of the tools.

The drive motor is placed behind the column of housing and close to the planer bed. The motor drives a simplified gear train through a large diameter tubular "Floating Shaft" having flexible connections at both ends similar to the propeller shaft of an automobile.

### Rockford hydraulic double housing

These planers, made by Rockford Machine Tool Co., Rockford, Ill., feature hydraulic drive to the table, and hy-

draulic feeds. Straight-line hydraulic pressure, exactly parallel to ways, is transmitted to table through anchor block. Thrust is taken in shear by large boss tightly fitted into socket in table.

**INCREASES  
PRODUCTION...**

**LOWERS COSTS...**

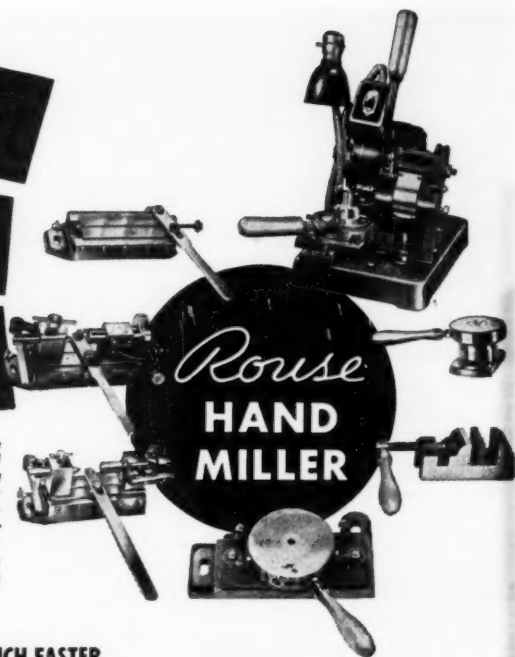
**PAYS FOR ITSELF  
QUICKLY...**

The ROUSE HAND MILLER is a widely used, inexpensive, high speed, ball bearing, motor driven machine for handling light cuts in brass, aluminum, steel, plastics, and other materials—fast, accurately, and at very low cost. Only \$98.00\*.

Fixtures (illustrated) extra.

Motor equipment:— $\frac{1}{4}$ H.P. 110 Volt AC 60 cycle, single phase, swivel motor mount and light—\$25.00\*

\* All prices FOB Chicago.

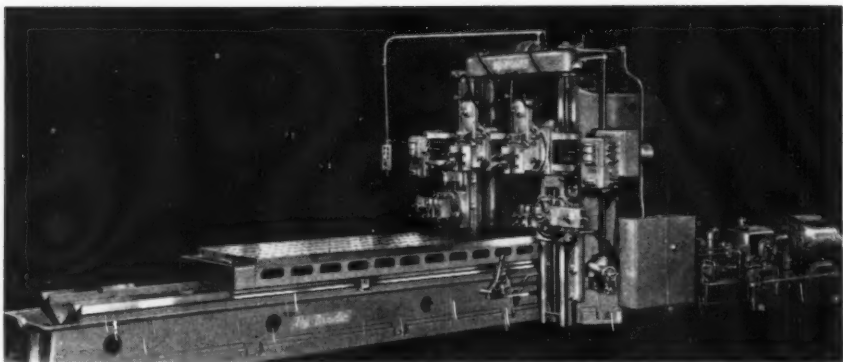


- ★ **MILLS SMALL PARTS MUCH FASTER.**
- ★ **DRASTICALLY CUTS YOUR INVESTMENT IN EQUIPMENT.** Replaces expensive production machinery—or releases it for other jobs.
- ★ **INEXPERIENCED HELP CAN OPERATE IT.** Safe, simple, fool-proof operation.
- ★ **NO MORE COSTLY SET-UP TIME.** \$98.00\* price so low that it pays to keep one or more Hand Millers always set-up for special operations.
- ★ **YOU GET A BETTER PRODUCT**—the result of ABSOLUTE ACCURACY.
- ★ **A LOSS BECOMES A PROFIT** when marginal pieces are finished on the Hand Miller instead of on high cost equipment.
- ★ **VERY LOW MAINTENANCE.**
- ★ **USED REGULARLY IN 1163 MANUFACTURING PLANTS** (some of which use as many as 30 machines)—yet on the market a scant few years.
- ★ **UNIQUE—VERSATILE.** Nothing else like it. One or several machines can be the answer to some of your production problems.

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for further  
information.**

**H. B. ROUSE & COMPANY**

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50 YEARS OF SERVICE TO INDUSTRY



Heavy cap-screws hold block in place. The anchor block is, in effect, part of the table, it is solidly locked to the piston rod.

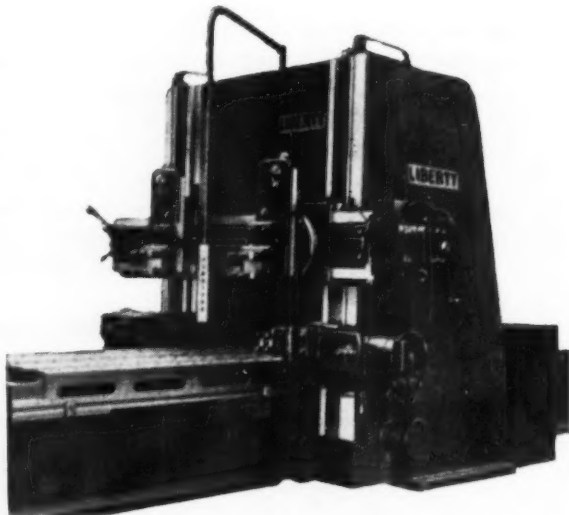
Each tool head has an automatic

hydraulic tool-lifter which acts quickly when table reverses for return stroke. Tools resume cutting position before the next cut begins. Entire operation is smooth, does not alter adjustment of slides, and can be shut off if desired.

### **Liberty double housing**

This planer, made by Liberty Planers, Inc., Div. Hamilton-Thomas Corp., is ideally suited for a large amount of production in a well-defined range. The planer is equipped with one, two, three, or four heads. Motor clamping and dual control provide ease of operation.

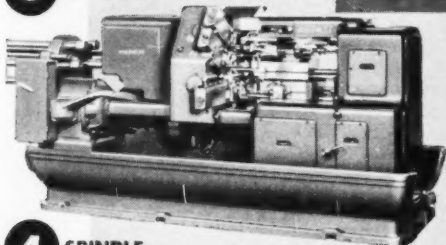
The bed is double length with bottom flange and adjustable screws for leveling. Position of tool is in front of bull gear. Cut is pulled into tool instead of being pushed. Force feed lubrication from motor-driven oil pump gives constant pressure, regardless of table travel and speeds. Dial indicators of rail and side head feeds with readings in thousandths. Micrometer adjustments in all vertical and horizontal feed rods.



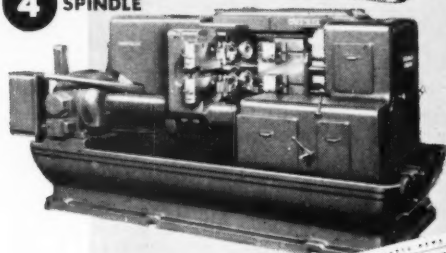
Binder screws are provided for locking tool slides rigid when taking heavy cuts.



## 6 SPINDLE



## 4 SPINDLE



# GREENLEE

## AUTOMATICS

Maximum economy of operation on long-run jobs, with an uncluttered, easily-reached tooling area that allows rapid and accurate positioning of tools and attachments... permitting precise inspection of work finish and tolerances *on the machine*. The Greenlee "Six" is available in 1", 1-5/8", and 2" capacity — the "Four" in 1-5/8" and 2-5/8" capacity.



## Automatic News

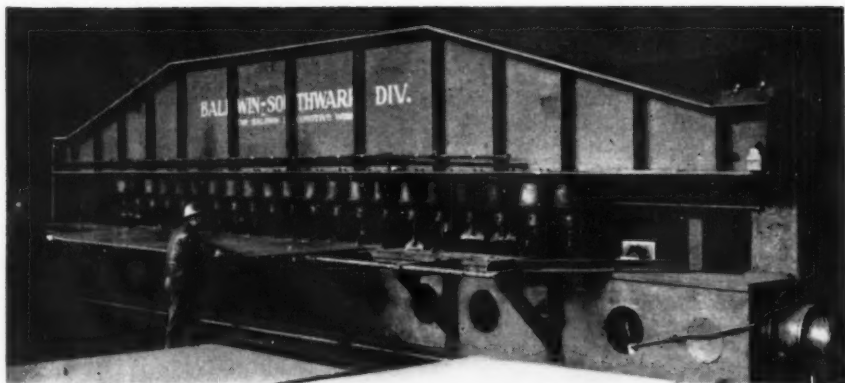
These free monthly issues are written expressly for those of you who are concerned with various phases of automatic screw machine production. They contain practical and informative articles dealing with tooling and maintenance, generously illustrated with drawings and photographs. If you wish your name added to our mailing list, send your request, on company letterhead, to:

The Editor, *Automatic News*

**GREENLEE BROS. & CO.**

1840 Mason Ave., Rockford, Illinois

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES



### **Baldwin plate planer**

A Baldwin 30 foot medium duty plate planer capable of handling 2 inch thick

steel plate at cutting speeds of 15 to 45 feet per minute. Planer is made by Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

### **Cleveland open side planers**

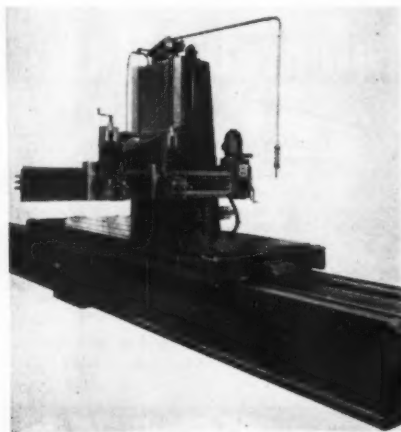
The beds, columns, tables, and knees of this planer, made by Cleveland Planer, Cleveland, O., are of special nickel chrome semi-steel castings. The table rack, rail and all heads are made of a special iron possessing high tensile strength and unusual resistance to fatigue and impact.

All mechanisms are above floor level, requiring no special pit or special

foundation. The dial feed ranges from zero to one inch by .010 and is positive acting. The planer has single rail clamp, forced feed lubrication and power rapid traverse. Planer features a duplex helical drive to bull gear.

The electric rapid traverse is a separate electrical unit operated independently through pistol grip control switch. It is impossible to engage feeds and rapid traverse at the same time.

A Mesta 16"x42" double breast planer made by Mesta Machine Co., Pittsburgh 30, Pa.



### **Cincinnati Hypro double housing**

All gearing on these planers, made by Cincinnati Planer Co., now a part of Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., including the bull wheel and rack is of the twin helical type. Instead of the usual  $14\frac{1}{2}^\circ$  pressure angle between the bull wheel and the rack an angle of approximately  $9^\circ$  is used. This eliminates tendency of bull wheel to lift table.

Forced lubrication is provided for the bed and table ways. Oil wells around

# SLASH SET-UP TIME

## with J&S KOALA CIRCULAR CUTTING TOOLS

**W**ITH these J & S Time Savers — available in carbide or high speed steel, at reasonable prices — each new or re-sharpened cutter can be inserted **without resetting** machine or stops in any way! This is possible because each cutter accurately **repeats** the original set-up position when it is inserted into the shank. Removing and inserting is quick and simple. Different types of cutters can be used in the same shank. J & S KOALA TOOLS are **easy** to re-grind with any desired rake. Cutters may be re-ground without a jig. It is *not* necessary to re-grind any predetermined amount off the rake surface. With KOALA TOOLS, the **same** tool can be used for turning and facing — the **same** shank may be used for forming, necking and grooving — and the **same** internal tool can be used for internal facing or boring.

### PRINCIPAL USES

**Boring Bars:** Boring, Facing, Threading, Forming.

**External Turning Tools:** Turning, Facing, Forming, Threading

*Write for Further Information*

**J&S TOOL CO. INC.**

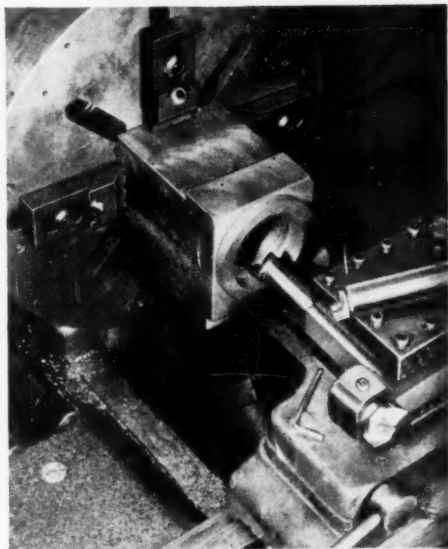


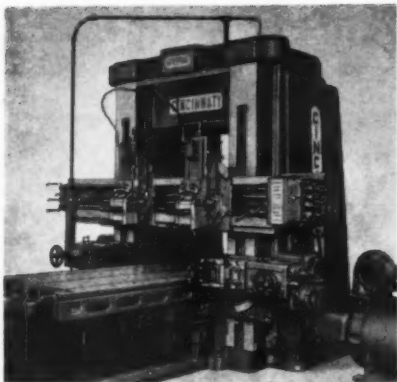
Photo shows typical deep boring, boring and internal facing operation for bearing seat, and external facing and turning. The 12" J & S KOALA Boring Bar is removed from turret to show carbide head after numerous re-grinds.

**SEND FOR BOOKLET,** "Machine Shop **TIME SAVERS** by J & S." Illustrates and explains: J & S "Fluidmotion" Dressers, KOALA Circular Cutting Tools, "Down-Hold" Vise Jaws and "Attachable" Parallels, "All-Purpose" Jaw Clamps, and J & S Form Grinding Service.



**471 MAIN STREET  
EAST ORANGE,  
NEW JERSEY**

•  
Representatives  
In Principal Cities



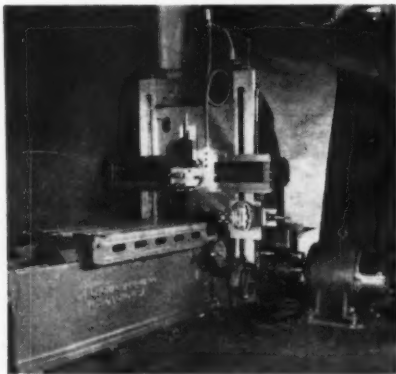
each shaft bearing are constantly filled. On machines 62" and above or 18' table length or over, a motor driven pump unit with a safety pressure switch is provided; in case of pump failure the machine automatically stops.

The bed ways are more than double the length of the table so that the table will not overhang or extend beyond the ends of the bed at any time.

The tee slots in the table are fitted with renewable steel inserts which prevent the damaging of the tee slots by bolt heads.

### **Ohio double housing**

Ohio standard and heavy duty double housing planers, made by The Ohio Machine Tool Co., Kenton, O., have several types of drives available: belt



drive with countershaft; plain motor drive on housings; two-speed motor drive on housings; ordinary reversing motor drive; variable-voltage reversing motor drive. The bed is of heavy, deep box construction with heavy bottom flanges equipped with hold-down bolts and levelling screws.

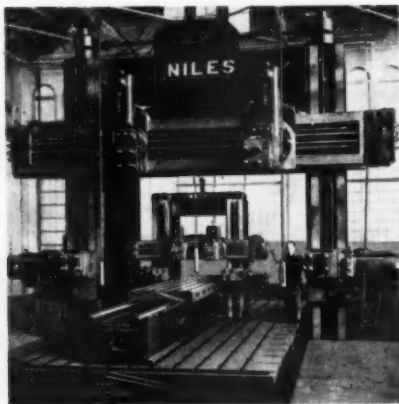
The regular length bed is 1.66 times the length of the table. Beds double the length of the table are available.

The housings are of box form of double-wall construction, heavily braced by internal walls.

The rail heads are of the universal type, graduated. They swivel to an angle of 140 degrees and have automatic power feed in all directions.

### **Niles 15 foot heavy planer**

This 15 foot heavy planer made by The Niles Tool Works Co., Div. Lima-Hamilton Corp., is equipped with two heads on crossrail, and two side heads, pneumatic tool lifters, double acting action, push and pull. Each has an independent feed and traverse by separate motors mounted on the feed boxes. Solenoid operated air valves on each head automatically control the pneumatic tool lifters. It is driven by a reversing drive motor, directly connected by a flexible coupling to the primary driving unit, consisting of a worm drive reduction gear unit mounted in a pit built in the foundation. A flexible coupling connects the out-



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**50%? 59%?**  
— even **75%?**

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**TAP SHARPENING**  
**EQUIPMENT**  
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**FOR OTHERS**



**No. 5** in a continuing study  
of Tap performance records made  
by users of Blake Tap Sharpening  
Equipment.

#### **TAP PERFORMANCE**

**Before Sharpening** Average  $1\frac{1}{4}$ "  
Taper Pipe Tap when lubricated cut  
2800 holes in die cast aluminum. At  
this point tap cut under size and was  
discarded because worn cutting edge  
did not permit resharpening.

**After Sharpening on Blake Equip-  
ment** Similar Tap, from the same box,  
reground on Blake Flute Grinder cut  
average 6,000 holes per grind. Average  
six grinds before tap is discarded as too  
small or too short in thread length.  
Total holes: 36,000 — an increase of over  
1200% per tap.

*Why Not You!*

To get dollar-for-dollar value from your  
taps, you *must* sharpen them just as you  
do other cutting tools. The Blake Flute  
Grinder and the Blake Chamfer Grind-  
er provide you with fast, accurate, and  
economical means for grinding straight  
flutes, spiral points, and the chamfered  
ends of your taps — a sure means of  
reducing your tap bill.  
Investigate today.

Ask for Bulletins 549 and 649

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Black Diamond Precision Drill Grinders ... Waltham Cutter Sharpeners ...  
Waltham Thread Milling Machines ... Surface Finish Standards.

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put shaft of the reduction gear unit with the drive gearing in the machine.

The flexible coupling takes care of small misalignment and prevents

cramping of the bearings. It is all metal completely enclosed and packed in grease. There are no non-metallic parts to wear out or become loose.

### Part 3. Specifications of American-built Planers

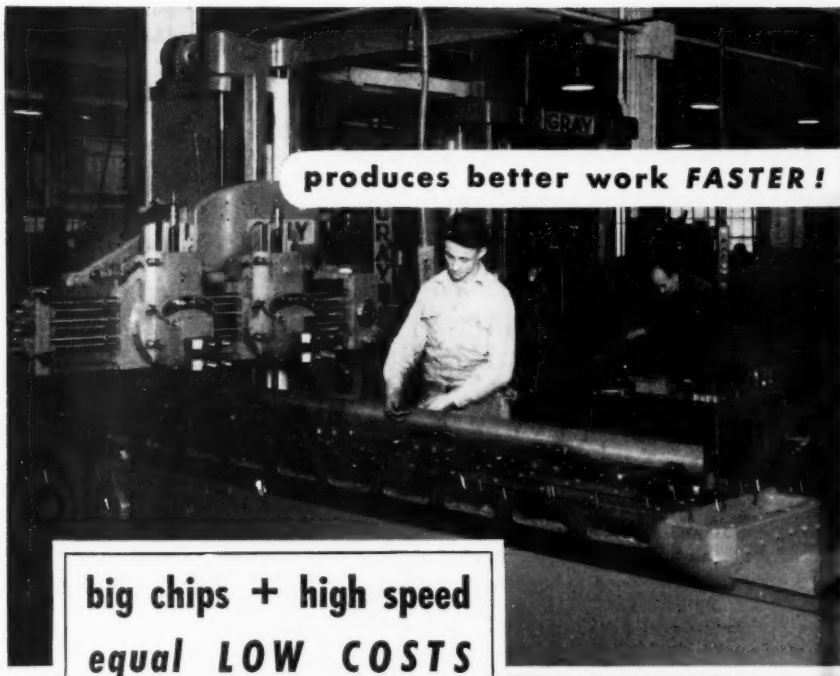
The G. A. Gray Company		Cincinnati, Ohio		
Type Size & Model	Capacity H=Distance Between Housing C=Max. Distance Under Cross Rail L=Length (basic) of Table between Pockets	Capacity XH=Max. Nominal Distance Between Housing NH=Min. Distance Between Housing TH=Max. Distance Tool in L.H. Railhead to inside Column Edge	Size W=Overall Width R.M.L. L=Overall Length H=Overall Height	Nominal Horse Power Required
<b>Double Housing</b>				
30"	H=31"; C=31"; L=8'2"		L=20'2"; H=8'	15-25
36"	H=37"; C=37"; L=8'2"		L=20'2"; H=8'7"	25-35
42"	H=43"; C=43"; L=8'2"		L=20'4"; H=9'9"	25-35
48"	H=49"; C=49"; L=10'2"		L=24'4"; H=10'4"	35-50
56"	H=57"; C=57"; L=10'2"		L=24'8"; H=11'2"	35-75
60"	H=61"; C=61"; L=12'2"		L=29'2"; H=12'2"	50-75
72"	H=73"; C=73"; L=12'2"		L=29'2"; H=13'2"	50-100
<b>Open Side</b> 24" Planer Cub	C=25"; L=Stroke plus 2	TH=31"; Table 23" wide	L=2 x stroke plus 3'9" H=8'9"	
30" Planer Cub	C=31"; do	TH=36"; Table 26" wide	L=2 x stroke plus 3'9" H=9'	
36" Planer Cub	C=37"; do	TH=42"; Table 32" wide	L=2 x stroke plus 3'9" H=9'6"	
36"	C=37"; L=8'2"	TH=48"; Table 33" wide	L=20'4"; H=9'10"	
42"	C=43"; L=8'2"	TH=54"; Table 39" wide	L=20'4"; H=10'4"	
48"	C=49"; L=10'2"	TH=60"; Table 45" wide	L=24'8"; H=11'5"	
60"	C=61"; L=12'2"	TH=78"; Table 57" wide	L=29'2"; H=13'1"	
72"	C=73"; L=12'2"	TH=91"; Table 68" wide	L=29'26"; H=15'1"	
<b>Switch Planer</b> 42"x42"x10'	H=43"; C=25"; L=10'2"	Table width=38"	L=23'6"	
<b>Die Block and Forge Planer</b> 42"x36"x10'	H=43"; C=37"; L=10'2"	do	do	
<b>Convertible</b>	A comprehensive line is available. Specifications from manufacturer.			

**Consolidated Machine Tool Corp.**

**Rochester, New York**

Currently not offering PLANERS in less than 84" sizes. Specifications from manufacturer.





**produces better work FASTER!**

**big chips + high speed  
equal LOW COSTS**

## save with a **GRAY PLANER CUB**

1. The planer for Carbide Tools — cutting and return speeds up to 300' per minute.
2. Speed of cut and return instantly adjustable from operating position.
3. Table started in either direction, reversed, "inched," or stopped from pendant switch.
4. Single-Shift power rapid traverse controlled at the heads or from either end of rail.
5. Space Saver Drive, with Full Floating drive shaft.
6. Non-Metallic Table Ways eliminate scoring.
7. Loop Lubrication. The only adequate system for high speed reciprocating tables.
8. Mechanical non-shock tool lifters.
9. Side head feed independent of rail heads.
10. Built in 24", 30" and 36" sizes.

Write for Fully Illustrated Descriptive Bulletin No. 55

*The G.A.* **GRAY** *Company*

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planer type milling machines  
horizontal boring machines

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**The Cleveland Planer Company**
**Cleveland, Ohio**

Type Size & Model	Capacity H=Distance Between Housing C=Max. Distance Under Cross Rail L=Length (basic) of Table Between Pockets	Capacity XH=Max. Nominal Distance Between Housing NH=Min. Nominal Distance Between Housing TH=Max. Distance Tool in L. H. Railhead to inside Column Edge	Size W=Overall width without motor bracket L=Overall Length H=Overall Height	Nominal Horse Power Required B=Belted Drive R=Reversing
<b>Open Side</b> 26"x26"x6'	C=30"; L=6'	TH=38"; Table 24½" wide	W=5'5"; L=14'3"; H=9'4"	B=7½; R=10
30"x30"x8'	C=35"; L=8'	TH=44"; Table 27½" wide	W=7'3"; L=18'5"; H=10'7"	B=10; R=15
36"x36"x8'	C=41"; L=8'	TH=51"; Table 34" wide	W=8'2"; L=18'5"; H=11'	B=10; R=15
42"x42"x10'	C=46"; L=10'	TH=61"; Table 37½" wide	W=8'10"; L=22'5"; H=11'5"	B=f5; R=20
48"x48"x12'	C=54"; L=12'	TH=72"; Table 44"-48" wide	W=10'2"; L=26'5"; H=12'8"	B=20; R=25-35
72"x72"x16'	C=76"; L=16'	TH=95"; Table 60" wide	W=12'10"; L=34'9"; H=16'8"	B=30; R=50

**The Ohio Machine Tool Company**
**Kenton, Ohio**

Type Size & Model	Capacity H=Distance Between Housing C=Max. Distance Under Cross Rail	W=Width of Table L=Length of Bed	Remarks	Nominal Horse Power
24"x24" Heavy	H=24½"; C=24½"	W=21" L=1.66xTable length	Can be furnished with one or two rail heads	5
30"x30" Standard	H=30½"; C=30½"	W=25" L=1.66xTable length	Can be furnished with one or two rail heads. Also available: 30"x30" heavy	5-10
36"x36" Standard	H=36½"; C=36½"	W=31" L=1.66xTable length	Can be furnished with one or two rail heads. Also available: 36"x38" heavy	10-20
38"x38" Heavy	H=39"; C=39"	W=33" L=1.66xTable length	Can be furnished with one or two rail heads and one or two side heads	15-20
42"x42" Standard	H=43"; C=43"	W=36" L=1.66xTable length	do	20-25
48"x42" Widened	H=49"; C=43"	W=42" L=1.66xTable length	do	do

**Baldwin-Lima-Hamilton Corp.**
**Philadelphia, Penn.**

Manufacture a comprehensive line of PLATE PLANERS. Specifications from manufacturer.

**Mesta Machine Co.**
**Pittsburgh 30, Pa.**

This company manufactures heavy duty planers to special specifications.

**The Niles Tool Works., Div. Lima-Hamilton Corp.**
**Hamilton, Ohio**

Manufacture a 15' Heavy DOUBLE HOUSING PLANER. Width between housing, 15'-2"; table width, 14'-0"; h.p. 100. Further specifications from manufacturer.



## OPEN SIDE PLANERS

Reduce production costs with this new machine that can be driven to full capacity year after year!

- Less parts—easier to operate
- Single turn Rail Clamp
- Forced Feed Lubrication
- Power Rapid Traverse
- Duplex Helical Drive to Bull Gear

Write for complete information.

For more than 50 years Cleveland Planers have built high quality equipment. This "know-how" is your assurance of top performance. Friendly engineering counsel is yours for the asking.

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## THE CLEVELAND PLANER

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## Giddings &amp; Lewis Machine Co.

Fond du Lac, Wis.

Type Size and Model	Capacity C=Max. Dist. Under Cross Rail H=Max. Width Between Housing	T=Width of Table L=Length of Table (min.) TH=Dist. of Tool in L.H. Rail Head to Inside Column Edge	Size H=Height Overall (Approx.) W=Width Overall (Approx.) L=Length of Bed (Min.)	Nominal Horse Power Required
<b>Double Housing</b> Cincinnati Hypro 36" x 36"	C=37"; H=37½"	T=32"; L=8'	H=10'2"; W=13'6"; L=20'	25
42" x 36"	C=37"; H=43½"	T=38"; L=8'	H=10'2"; W=14'; L=20'	do
48" x 36"	C=37"; H=49½"	T=44"; L=8'	H=10'2"; W=14'6"; L=20'	do
42" x 42"	C=43"; H=43½"	T=38"; L=10'	H=11'4"; W=15"; L=24'	35
56" x 42"	C=43"; H=57½"	T=52"; L=10'	H=11'4"; W=16'2"; L=24'	do
48" x 48"	C=49"; H=49½"	T=44"; L=10'	H=11'10"; W=15'6"; L=24'	do
60" x 48"	C=49"; H=61½"	T=56"; L=10'	H=11'10"; W=16'6"; L=24'	do
56" x 56"	C=57"; H=57½"	T=52"; L=10'	H=12'10"; W=16'2"; L=24'	do
72" x 56"	C=57"; H=73½"	T=68"; L=10'	H=12'10"; W=17'6"; L=24'	50
62" x 62"	C=63"; H=64½"	T=58"; L=12'	H=13'10"; W=18'8"; L=28'	do
72" x 62"	C=63"; H=74½"	T=68"; L=12'	H=13'10"; W=19'6"; L=28'	do
72" x 72" Standard	C=73"; H=74½"	T=68"; L=12'	H=14'10"; W=19'6"; L=28'	do
72" x 72" Heavy	do	T=68"; L=12'	H=14'10"; W=19'6"; L=28'	do
84" x 72"	C=73"; H=86½"	T=80"; L=12'	H=14'10"; W=20'6"; L=28'	do
96" x 72"	C=73"; H=98½"	T=92"; L=12'	H=14'10"; W=21'6"; L=28'	do
84" x 84"	C=85"; H=86½"	T=80"; L=12'	H=16'6"; W=21'6"; L=28'	50 or 75
96" x 84"	C=85"; H=98½"	T=92"; L=12'	H=16'6"; W=22'6"; L=28'	do
120" x 84"	C=85"; H=122½"	T=108"; L=12'	H=16'6"; W=24'6"; L=28'	do
96" x 96" Standard	C=97"; H=98½"	T=92"; L=12'	H=17'6"; W=22'6"; L=28'	do
96" x 96" Heavy	do	T=92"; L=12'	H=17'6"; W=22'6"; L=28'	do
120" x 96"	C=97"; H=122½"	T=108"; L=12'	H=17'6"; W=24'6"; L=28'	do
120" x 120"	C=121"; H=122½"	T=108"; L=12'	H=19'6"; W=24'6"; L=28'	do
<b>Die Block Planer</b> 42" <b>Frog &amp; Switch Planer</b> 42" <b>Railguide Planer</b> 72"	Specifications from manufacturer. Built to suit special requirements.			

## Giddings &amp; Lewis Machine Co.

## Fond du Lac, Wis.

Type Size and Model	Capacity C=Max. Dist. Under Cross Rail H=Max. Width Between Housing	T=Width of Table L=Length of Table (min.) TH=Dist. of Tool in L.H. Rail Head to Inside Column Edge	Size H=Height Overall (Approx.) W=Width Overall (Approx.) L=Length of Bed (Min.)	Nominal Horse Power Required
<b>Open Side</b>				
36"	C=37"	T=36"; L=8'; TH=48"	H=11'8"; W=14'6"; L=20'	25-35
42"	C=43"	T=42"; L=10'; TH=54"	H=12'8"; W=15'; L=24'	35-50
48"	C=49"	T=48"; L=10'; TH=60"	H=13'2"; W=15'6"; L=24'	35-50
60"	C=61"	T=58"; L=12'; TH=79"	H=16'; W=19'6"; L=28'	50-75
62"	C=63"	T=62"; L=12'; TH=79"	H=16'; W=19'6"; L=28'	do
72"	C=73"	T=68"; L=12'; TH=91"	H=17'6"; W=20'6"; L=28'	do
84"	C=85"	T=80"; L=12'; TH=103"	H=19'6"; W=21'6"; L=28'	do
84"	C=85"	T=80"; L=12'; TH=103"	H=19'6"; W=23'; L=28'	do
96"	C=97"	T=96"; L=12'; TH=120"	H=20'6"; W=24'6"; L=28'	do
96" special	C=97"	T=108"; L=12'; TH=132"	H=20'6"; W=25'6"; L=28'	do
Hydraulic 24"	C=25"	T=24"; L=6'; TH=31"	H=92"; W=108"; L=15'	
30"	C=41"	T=28"; L=6'; TH=41"	H=98"; W=112"; L=15'	
36"	C=41"	T=32"; L=6'; TH=41"	H=104"; W=118"; L=15'	

## Liberty Planers, Inc., Div. of Hamilton-Thomas Corp.

## Hamilton, Ohio

Type Size and Model	Capacity H=Distance Between Housing C=Max. Distance Under Cross Rail L=Length (basic) of Table Between Pockets	Capacity XH=Max. Nominal Distance Between Housing NH=Min. Distance Between Housing TH=Max. Distance Tool in L. H. Railhead to inside Column Edge	Size W=Overall Width R.M.D. L=Overall Length H=Overall Height	Nominal Horse Power Required
<b>Convertible</b>				
60"x36"x8'	C=43"	XH=61"; NH=43"	W=15'2"; L=19'; H=9'6"	20-25
72"x42"x10'	C=49"	XH=73"; NH=49"	W=16'4"; L=25'; H=10'	25-35
84"x48"x10'	C=54½"	XH=85"; NH=55"	W=17'6"; L=23'; H=11'	35-50
96"x54"x10'	C=60½"	XH=97"; NH=61"	W=18'; L=23'; H=11'6"	35-50
108"x60"x12'	C=66"	XH=109"; NH=69"	W=20'8"; L=27'; H=13'	50-75
120"x72"x12'	C=78"	XH=121"; NH=81"	W=21'8"; L=27'; H=13'10"	50-75
120"x84"x12'	C=85"	XH=121"; NH=96"	W=22'8"; L=27'; H=14'10"	75
144"x96"x12'	C=97"	XH=145"; NH=110"	W=25'; L=27'; H=16'	75

**Liberty Planers, Inc., Div. of Hamilton-Thomas Corp.**
**Hamilton, Ohio**

Type Size & Model	Capacity H=Distance Between Housing C=Max. Distance Under Cross Rail L=Length (basic) of Table Between Pockets	Capacity XH=Max. Nominal Distance Between Housing NH=Min. Distance Between Housing TH=Max. Distance Tool in L. H. Railhead to inside Column Edge	Size W=Overall Width R.M.D. L=Overall Length H=Overall Height	Nominal Horse Power Required
<b>Double Housing</b> 36"x36"x8'	H=37"; C=39½"; L=8'	(See convertible planers)	W=11'10"; L=19'; H=8'3"	20-25
48"x48"x10'	H=43"; C=45½"; L=10'		W=12'4"; L=23'; H=8'9"	25-35
48"x48"x10'	H=49"; C=52"; L=10'		W=13'6"; L=23'; H=9'7"	35-50
54"x54"x10'	H=55"; C=58"; L=10'		W=14'; L=23'; H=10'1"	35-50
60"x60"x12'	H=61"; C=66"; L=12'		W=15'8"; L=27'; H=11'	50-75
72"x72"x12'	H=73"; C=78"; L=12'		W=16'8"; L=27'; H=12'	50-75
84"x84"x12'	H=85"; C=85"; L=12'		W=18'7"; L=27'; H=13'	75
96"x96"x12'	H=97"; C=97"; L=12'		W=19'7"; L=27'; H=14'	75
120"x120"x12'	H=121"; C=121"; L=12'		W=22'7"; L=27'; H=16'	75
<b>Standard Design</b> 24"	H=25"; C=25"; L=6'		W=6'3"; L=13'1"; H=6'1"	5
30"	H=31"; C=31"; L=8'		W=7'4"; L=17'4"; H=7'2"	10
36"	H=37"; C=37"; L=8'		W=8'6"; L=17'6"; H=8'3"	15
42"	H=42"; C=43"; L=10'		W=9'2"; L=21'6"; H=8'10"	20
<b>Open Side</b> 36"x36"x8'	C=43"; L=8'	TH=48"	W=12'6"; L=19'; H=9'6"	20-25
42"x42"x10'	C=49"; L=10'	TH=48"	W=12'7"; L=25'; H=10'	25-35
48"x48"x10'	C=54½"; L=10'	TH=60"	W=14'2"; L=23'; H=11'	35-50
54"x54"x10'	C=60½"; L=10'	TH=60"	W=14'2"; L=23'; H=11'6"	35-50
60"x60"x12'	C=66"; L=12'	TH=75"	W=16'9"; L=27'; H=13'	50-75
72"x72"x12'	C=74"; L=12'	TH=91"	W=18'; L=27'; H=15'10"	50-75
84"x84"x12'	C=85"; L=12'	TH=91"	W=19'2"; L=27'; H=14'10"	75
96"x96"x12'	C=97"; L=12'	TH=97"	W=20'2"; L=27'; H=16'	75
<b>Standard Design</b> 24"	C=25"; L=6'	TH=31"	W=7'3"; L=13'1"; H=7'4"	5
30"	C=31"; L=8'	TH=40"	W=8'6"; L=17'4"; H=8'6"	10
36"	C=37"; L=8'	TH=48"	W=9'10"; L=17'6"; H=9'3"	15
42"	C=43"; L=10'	TH=55"	W=10'8"; L=21'6"; H=10'	20



## Rockford Machine Tool Co.

## Rockford, Illinois

Type Size and Model	Capacity C=Max. Dist. Under Cross Rail Pl=Planing Width Left Hand Rail Head Pr=Planing Width Right Hand Rail Head	T=Table Working Surface C=Cutting Speed	Size W=Overall Width L=Overall Length H=Overall Height (approximate)	Nominal Horse Power Required
<b>Double Housing</b> 36"x36" (48"x48" reduced)	C=37"; Pl=36"; Pr=42"	36"x10', 12', 14', 16', 18', 20' 0 to 50'; heavy duty; 0 to 80' medium duty; 0 to 105' light duty	W=10'11" L=27'4"; 30'9"; 34'9"; 38'9"; 43'1"; 47'1" H=8'10"	40
42"x42"	C=42½"; Pl=36"; Pr=42"	38"x10', 12', 14', 16', 18', 20' do	W=10'11" L=27'4"; 30'9"; 34'9"; 38'9"; 43'1"; 47'1" H=9'6"	do
48"x48"	C=48½"; Pl=42"; Pr=48"	44"x10', 12', 14', 16', 18', 20' 0 to 40' heavy duty; 0 to 50' med. duty; 0 to 80' light duty	W=11'5" L=27'5"; 31'4"; 35'2"; 39'2"; 43'2"; 47'2" H=9'10"	do
60"x60"	C=60½"; Pl=54"; Pr=60"	56"x10', 12', 14', 16', 18', 20' do	W=12'5" L=27'5"; 31'4"; 35'2"; 39'2"; 43'2"; 47'2" N=10'10"	
<b>Open Side</b> 36"x36"	C=40"; Pl=55"; Pr=41"	36"x10', 12', 14', 16', 18', 20'; 0 to 50' heavy duty; 0 to 80' med. duty; above 80' light duty	W=9'6" L=27'31', 35', 39', 43', 37' H=10'8"	40-60
42"x42"	C=46"; Pl=61"; Pr=47"	42"x10', 12', 14', 16', 18', 20' do	W=10" L=27', 31', 35', 39', 43', 47' H=11'2"	do
48"x48"	C=48½"; Pl=61"; Pr=48"	44"x10', 12', 14', 16', 18', 20'; 0 to 40' heavy duty; 0 to 80' med. duty; above 80' light duty	W=10" L=27', 31', 35', 39', 43', 47' H=11'5"	do
60"x60"	C=60½"; Pl=73"; Pr=60"	56"x10', 12', 14', 16', 18', 20' do	W=11" L=27', 31', 35', 39', 43', 47' H=12'5"	do

**NOTE:** Some of the manufacturers listed here manufacture planers in other than the sizes shown. These are usually built to customer requirements.

In view of the various types of drives and the technical characteristics of drives it is important to consider drives when specifying planers. It is important that the planer requirements can be met by the proper drive.

### Reprints of Special Reports Now Available

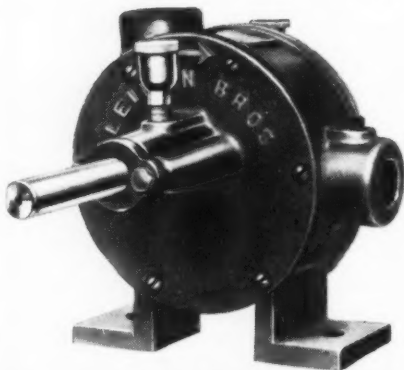
There are available reprints of most of the previously published Special Reports, at no charge. These include: Press Brakes; Thread Rolling; Milling Machines; Honing, Lapping and Superfinishing Machines; Automatic Screw Machines; The MAPI Replacement Formula; Chucking Machines; Turret Lathes, Hand Screw Machines; Broaching Machines; Shapers, Slotters and Keyseaters; Lathes (in three parts).

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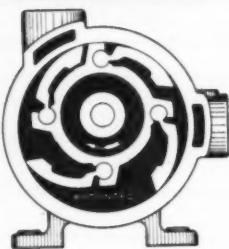
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## **Baker Oil Tools, Inc. cuts paper work costs by two thirds**

Baker Oil Tools, Inc. of Los Angeles has a half-dozen uses—and a dozen direct benefits—from its punched-card (tabulating) procedures.

Adding up the score for punched-card procedures for the handling of production control, sales analysis, inventory control, payroll and labor distribution, tax reports and handling its accounts receivable, Baker's chief accountant, W. R. Burnham, sums it up this way:

1. "Five operators working with punched-card equipment will do in one shift, at a total cost of 8 clerical salary units, the work that would require at least 15 units manually . . . Moreover, if we attempted to do the work as accurately, it would be more likely to take 20 clerical units.

2. "With punched-cards it requires three days' time of one girl to complete the sales register and analysis . . . It formerly required 37 clerical days for an incomplete analysis.

3. "We save 80% of the former cost, and get more accurate and complete data.

4. "We gain in every department through the accuracy, promptness, clarity and completeness of the data we furnish.

5. "Production (machine-hour and labor) reports are so promptly produced

we actually save enough there alone to more than pay the rental of our punched-card equipment."

Baker Oil Tools, which employs some 675 workers, has been able to center all of its machine-hour, labor, sales analysis, payroll and special reports in a five-clerk department equipped with the following Remington Rand equipment: 2 high speed Sorters, 2 Automatic Punches, Numerical Tabulator and Summary Punch, Interfiling Reproducing Punch and an Alphabetical Tabulator.

The company specializes in tools for oil-well drilling and production. Its products number 150 basic items and must be available up to 20 sizes. Each size may be called for in approximately 15 threads. Individual variations start from there, to suit the requirements of customers.

Baker Oil Tools' executives decided some time ago that high-speed and largely automatic mechanical means were needed for the accounting and production controls required by their operations, and decided on Remington Rand tabulating punched-card procedures.

This is a control system in which facts and figures are transmitted to cards by means of punched holes. Each of these cards represents an original



Part of the company's tabulating department . . . with operators at the various machines.

handwritten record, as for example, a work order. The holes in the cards actuate other machines to perform various operations, such as printing the information on the cards, sorting them, filing them, etc. When punched and combined with others, each card is a medium for producing records and reports, on very short notice, wide in scope and as detailed as desired.

### **Unit card labor records**

Top punched-card operation at Baker Oil Tools is the tabulating of the records of labor put in on each work order. Unit cards are punched from the daily time tickets and filed in an "in-process" pool, awaiting the receipt of work orders from the shop. As soon as the shop returns its copy of the work order showing completion of the job, a clerk removes the tabulating cards from those orders from the "in-process" pool, sorts them (at the rate of 25,200 cards an hour) by machine number, and runs the labor expended on each work order on the reverse side of the

shop copy of the order. Later on, the same thing is done for labor and materials.

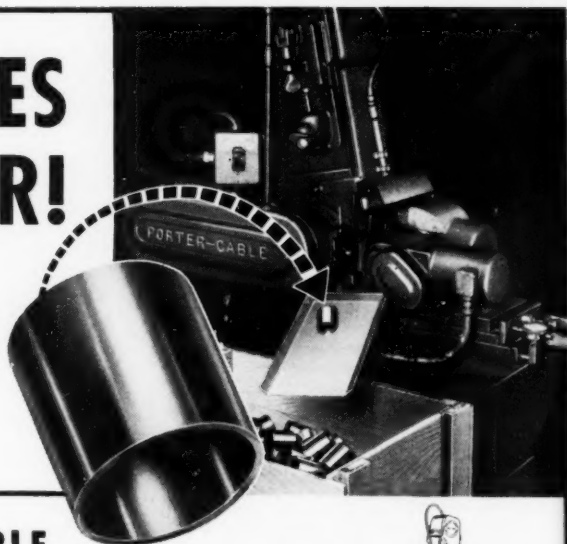
Also listed in the tabulated reports is proof of delivery to the warehouse, together with the date of completion of the work. Finally, the total is transferred to the face of the order for the general accounting records. More than 100 of these work orders are prepared by the punched-card method each day. This constitutes approximately 2½ hours of machine and clerical work.

Later the labor cards are used for payroll preparation, with a summary card punched for each man's earnings for each day in the shop. These summary cards are used in printing his semi-monthly payroll registry entries and check on the tabulating machine. Office, warehouse, service and sales pay-rolls are handled similarly by the punched-card method.

Semi-monthly total summary cards are made up and subsequently are used for the preparation of quarterly Social Security reports, and also to make

# 8 TIMES FASTER!

on this  
centerless  
grinding  
job...



## PORTER-CABLE ABRASIVE-BELT MACHINING

**The piece:** Steel tubing, 16 ga. x  $1\frac{3}{8}$ " O.D.

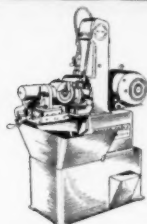
**The job:** Grind to size with a good finish. Maintain tolerance of .002".

**Previous method:** Pieces individually mounted on arbor . . . placed between centers on a cylindrical grinder.

**New method:** Work placed on a Porter-Cable Centerless Wet-Belt Grinder. Through-feed fixture used—.002 to .004" removed — tolerance maintained.

**Result:** .23 hrs. per 100 pieces by new method, against 1.95 hrs. per 100 pieces by old method . . . a saving of 1.72 hrs. per 100 pieces!

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Porter-Cable's L-4 Centerless Wet-Belt Grinder saves 75% to 90% of set-up time on a wide range of work. Eliminates truing, balancing and continual wheel dressing. Handles stock from  $\frac{3}{32}$ " to  $2\frac{1}{4}$ " dia. Diameter reduction up to .010". Size control to  $\pm .001$ " or better.

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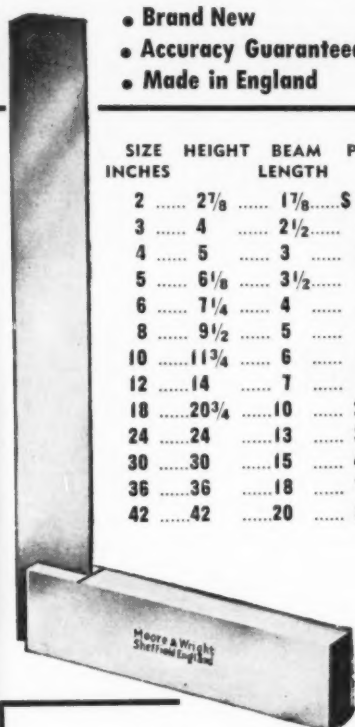
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SIZE INCHES	HEIGHT	BEAM LENGTH	PRICE
2	2 7/8	1 7/8	\$ 2.00
3	4	2 1/2	2.25
4	5	3	2.50
5	6 1/8	3 1/2	2.75
6	7 1/4	4	3.00
8	9 1/2	5	4.00
10	11 3/4	6	6.00
12	14	7	8.00
18	20 3/4	10	25.00
24	24	13	39.00
30	30	15	45.00
36	36	18	70.00
42	42	20	80.00

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Up to 12" size supplied in wooden box. 18" size and over supplied in strong wooden sheaths.

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W. R. Burnham, chief accountant of Baker Oil Tools, Inc.

simple labor distribution by departments, classes of labor and location, for about 100 classifications.

### Production control applications

Baker Oil Tool applications of the punched-card method to production control include an 11 A.M. daily preparation of machine-hour reports that provide an early indication of machine loadings and performance, type of production for each machine, and idle machine time. A daily production control report by operations is also prepared on the tabulating machine. This is used to control individual shop orders by entering the elapsed time required each day, and to show the backlog of work for each machine.

Labor distribution, production controls and payroll activities require approximately 40% of the tabulating department's time. The sales analysis reports and the handling of accounts receivable require 25% of the department's attention, and miscellaneous and special reports take up the balance. Three types of tabulating or punched-cards are used: one for labor and for payroll deductions, the second for branch transfers and domestic and ex-



# High Production Milling *Saves Labor... Cuts Costs*

For high production with precision—put the work on Kent-Owens Milling Machines! They're designed for rapid, easy set-up and operation. Rugged . . . with twin-post head mounting that assures balanced load—no chattering. Practical features throughout to help you produce more . . . save labor . . . and reduce costs! Write for bulletin. Kent-Owens Machine Co., Toledo, Ohio.



No. 2-20 Milling Machine  
Table, 42" x 12"  
Table travel, 20"

## KENT-OWENS *Milling Machines*

port sales, and the third for shop orders, vouchers and prepaid expense.

### Full and fast with figures

For the handling of sales analysis reports and accounts receivable on annual volume exceeding \$7,000,000, unit sales cards are punched. These show the sales volume and territorial breakdown information, and the flat cost of each item. From the same cards, the tabulating departments prepares the in-

voice register and an accounts receivable register, which later can be amplified to include statements where necessary.

Commenting on the punched-card handling of sales analysis material and of accounts receivable Chief Accountant Burnham has this to say:

"Our sales were never analyzed in such detail before the punched-card method was adopted. It formerly required 37 clerical days for the incom-



## Fast, Fatigue-free ELECTROPUNCH Boosts Small Parts Production

The girl above stakes 3500 electrical switch blades per hour on the ELECTROPUNCH — and she can maintain this production all day, without strain. Production of 10,000 pieces per hour is attainable when automatic switching is used. This new, versatile electromagnetic impact hammer is ideal for light staking, swaging, crimping, marking, riveting, or cutting operations. You can move it wherever you want and plug it in your nearest 115 V. outlet. Lightest model selling for only \$90.75, the ELECTROPUNCH quickly pays for itself! Investigate its amazing time-saving features now!

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**BLACK & WEBSTER, INC.**

DEPT. 5, 445 WATERTOWN STREET, NEWTON 58, MASS.

plete figures we then obtained. Now, with punched-cards, it requires but three days' time for one girl to complete this sales register and analysis.

"Our sales register tabulations are made up geographically and by product. We sell in 30-some states to all the large oil companies, and in countries abroad. We maintain five sales offices in California and 24 offices in other states. We compile 100 geographical breakdowns by 150 classes of prod-

ucts, and individual reports are prepared for many of the 100 breakdowns. This means that each division receives only the report covering its own territory. Further, each month from 20 to 25 special reports for executives, our sales offices and the Government are produced by our five punched-card operators.

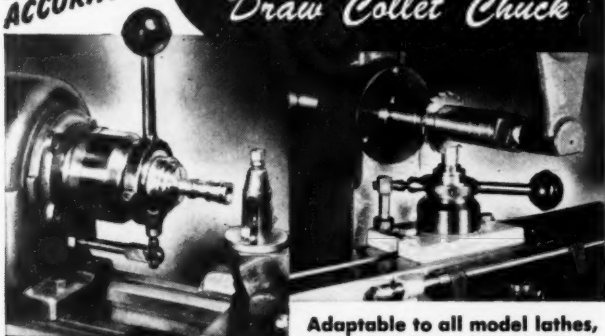
"We also prepare a completely documented Sales Tax Recap for each taxing authority, starting with gross sales

**GREATER  
ADAPTABILITY  
PRECISION  
ACCURACY**

with the New...

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*Draw Collet Chuck*



Adaptable to all model lathes, drill presses, and milling machines. Uses all Standard Draw Collets. Features continuous loading and unloading without stopping. All working parts hardened and precision ground. Simple installation and adjustment. Sure positive gripping action at all times.

Size	Std. Draw Collets	Capacity Inclusive	Body Diameter	Overall Length	Approximate Weight
113	3C	1.64" to 1.75"	2 1/8"	3C - 2 1/8"	2 lbs.
114	4C	1.64" to 1.75"	2 1/8"	4C - 3"	3 1/2 lbs.
115	5C	1.64" to 1.75"	3 1/8"	5C - 3 1/8"	4 1/2 lbs.
116	6J	1.52" to 1 1/4"	4 1/8"	6J - 3 1/8"	11 lbs.
117	7J	1.52" to 1 1/4"	4 1/8"	7J - 3 1/8"	11 lbs.

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and eliminating, by types, all non-taxable sales to determine net taxable sales. This is then followed by a numerical (by invoice number) list of all non-taxable items showing the reasons for their non-taxability. This method has been scrutinized by many state tax auditors and they have yet to find any inaccuracies."

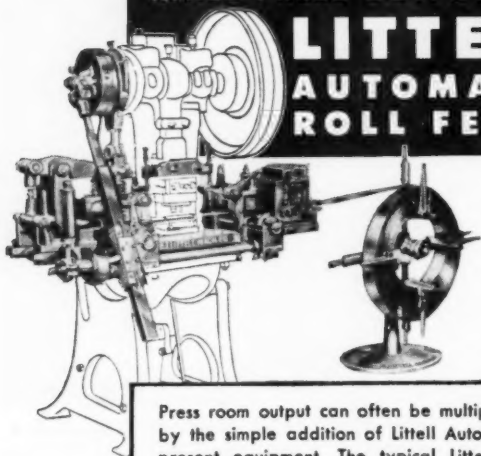
#### Stock and other controls

Under the punched-card procedure,

inventory control is now actually a by-product of the sales register and sales analysis tabulating activity. Reports are regularly prepared on the tabulating machine from the sales cards for stock control purposes. These show the stock movements from 38 warehouses. The costs of units sold are shown in these cards, so that they can be used to tabulate rough profit reports to guide management in determining whether an area or items are profitable.

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**LITTELL  
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Press room output can often be multiplied five times by the simple addition of Littell Automatic Feeds to present equipment. The typical Littell Double Roll Feed shown here grips the stock on both sides of the die to assure maximum traction and feeding power. Stock is easier to start and finish in progressive die work. No hand feeding at either end of the stock. Rack and pinion drive provides the smoothness and the gradual acceleration and deceleration of feed rolls for a truly accurate feed. Standard Littell Automatic Feeds serve all types and sizes of presses, handle all standard widths and thicknesses of stock.

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PURCHASE A PACKAGE OF SATISFACTION**

Expense and voucher distribution reports are tabulated, as are the cost reports for materials and maintenance, and royalty payment accounting is handled as a by-product of that procedure.

Cards are used to furnish all general ledger entries, except journal entries. The posting of the general ledger now takes only 3 days' time of one clerk, with an average of 1,400 postings a month handled, often in as many

as 400 accounts and sub-accounts.

Tax reports for employees, showing their total gross earnings, are prepared entirely by machine processes from the payroll summary cards. Plant equipment (depreciation and obsolescence) reports are tabulated by means of unit cards that have been punched for each piece of equipment. Fixture and furniture reports are made up in the same way.

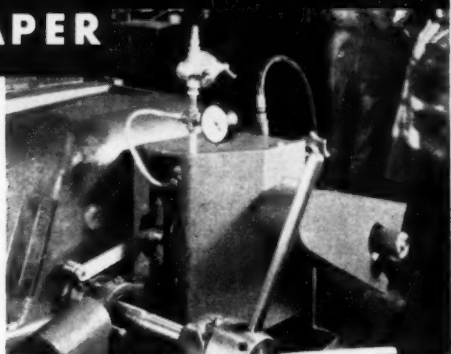
In commenting on the economic ad-

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## *with the* **AUTO-FEED ATTACHMENT**

This low cost attachment has paid for itself many times over on thousands of jobs. Production on many of them has been increased more than 200%. The AUTO-FEED has proven to be fool-proof and requires practically no maintenance. The AUTO-FEED attachment works directly off the lead screw of the centerless grinder. Thus the AUTO-FEED will always have the same accuracy as the lead screw.

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- Easy, Simple Installation
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- Will Handle All Types of Infeed Work, Including Shoulder and Taper Grinding.

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vantages of their punched-card procedures, Mr. Burnham states:

"With 8 clerical units representing the machines and clerical cost of operating our tabulating department, it is significant to note that all of our payroll and labor distribution is done at approximately the cost of two clerical salary units; all of the sales, costs and sales analysis and accounts receivable work is handled at a cost of two-and-a-half clerical salary units, and all of the

miscellaneous and special reports are taken care of at the equivalent of three-and-a-half clerical salary units.

"It is to be noted that these figures include machine rental, card costs and operators' salaries, and they take the proposition only from the standpoint of savings effected in accounting and other control costs. As a matter of fact, we gain much else from the data so promptly and accurately produced, and

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The RPM's stay up while grinding ... not only when the grinder runs idle.

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Weight 12 ounces;  
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- Skilled in DIE CASTING Mechanics
- Experienced in LUBRICATION Engineering
- Originators of Really High Speed AIR TOOLS

it would indeed be difficult to operate with anything like our present efficiency without these extensive figure compilations and reports.

"Our plans for the future include the mechanization of even more of our record-keeping functions. The first operation we are contemplating is a system to produce a capital assets register and depreciation journal. The necessary preliminary work is going ahead at this time. Under the proposed plan we will be able to age individual assets, groups of similar assets, or assets by geographical location, and furnish original cost, accrued depreciation and book value on any combination that may be required."

Photographs through courtesy of  
Remington Rand, Inc.

The End

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MILLING

LARGE OR SMALL PARTS

UNIFORM  
ACCURATE  
MAXIMUM **PRODUCTION**

WRITE FOR DETAILS

Manufactured by  
**HEUSER MFG. CO.**

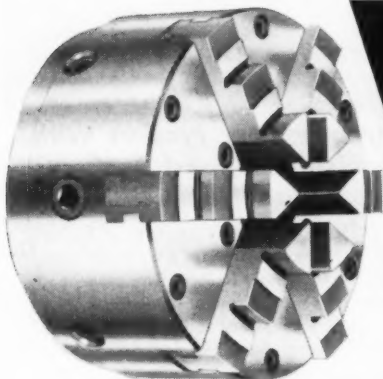
1638 N. Paulina St. Chicago 22, Ill.



# Buck

ADJUST-  
TRUE

## CHUCKS



# .0005 PRECISION

## In 1 MINUTE

### NOTHING LIKE IT!

This is the first and only successful dual control chuck. Its operation is easy to understand and use. One pinion (see center of chuck body above) moves jaws in or out to grip work — just like any scroll chuck. 4 opposed screws (only two can be seen in photo) work on the chuck adapter to bring work to dead center. Even dubs have centered work within .0005" in 3 minutes. Once set dead true, hundreds of duplicate parts can be machined without changing adjustment — by simply using the scroll control.

### **Fastest chuck in the world!**

Saves fooling around adjusting the grip of four jaws . . . cellophane shims . . . "springing". Keeps the same .0005" precision chucking duplicate parts **with scroll chuck speed.**

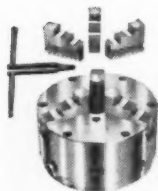
**6" 6-jaw Buck handles the work of 93 collets** — yet it's priced in line with ordinary chucks!

Those are just some of the features of this new kind of chuck. They are unbelievable — but TRUE! Send for literature — see for yourself.

## **BUCK TOOL COMPANY**

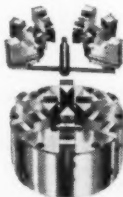
1012 Schippers Lane

Kalamazoo, Mich.



**3 STEP-JAW  
CHUCK**

4 sizes—  
4"—light duty  
5", 6", 7½"—  
heavy duty



**6 STEP-JAW  
COLLET CHUCK**

4 sizes—  
4"—light duty  
5", 6", 7½"—  
heavy duty

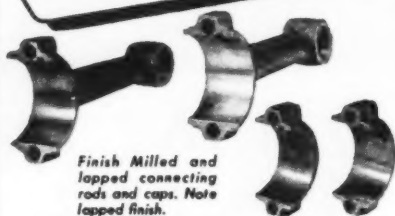


**6 JAW  
PRODUCTION  
COLLET CHUCK**

4 sizes—  
4"—light duty  
5", 6", 7½"—  
heavy duty

FROM FINISH MILLING TO  
A LAPPED FINISH AND  
FLATNESS OF 1 LIGHT BAND  
(.0000116") AT THE RATE OF

**612** CONNECTING  
RODS AND CAPS  
PER HOUR

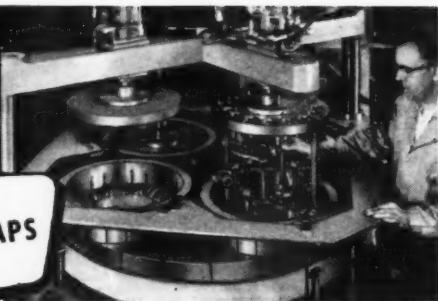


Finish Milled and  
lapped connecting  
rods and caps. Note  
lapped finish.

This is an unusual Lapmaster installation for two reasons. Production is high and the parts are not generally lapped. The reason for this is that the shape of the part makes it impractical to lap except on a Lapmaster. The Lapmaster handles 30 connecting rods and 30 caps per load. It takes but one minute to lap these down to a flatness of one light band. No polishing is necessary and grinding is eliminated entirely. Note that two conditioning rings are used for caps and two for the rods.

### Lapmaster Handles Different Parts in One Cycle or Large Quantities of Same Part in One Cycle

The Lapmaster is an amazingly versatile machine, capable of generating surfaces of precision flatness and finish in short runs or in high production quantities. It handles a wide range of parts and materials such as monel, steel, bronze, cast iron, quartz, ceramics, etc. In one cycle the Lapmaster can precision-lap either identical parts or parts of dissimilar shapes and materials.



### Improve Your Product With Precision Lapped Surfaces . . . With No Sacrifice in Production

Where accuracy of flatness and finish are important in product performance, the Lapmaster becomes one of the most important pieces of equipment in the plant. It is no longer necessary to forego the advantages lapping can bring to your product, (from a performance or cost standpoint) due to production requirements. There's a Lapmaster to fit your job . . . regardless of size of parts or production requirements.

### Investigate This New Lapping Machine and Method

# NOW!

A study of this 16 page booklet will reveal new possibilities for you in lapping precision and production. Actual production figures are given on five different size Lapmasters as well as the machine design features and specifications of this outstanding machine. Write for it today. Address your request to Dept. BB-10



## CRANE PACKING COMPANY

LAPMASTER DIVISION

1800 CUYLER AVENUE • CHICAGO 13, ILLINOIS

Offices in All Principal Cities in United States and Canada

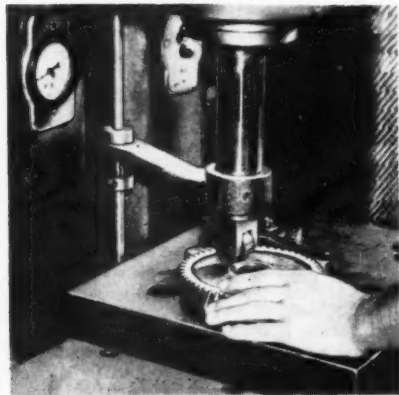


## Gear marking production increased 800 percent

A large manufacturer of automobile timing gears has increased one phase of production by almost 800 percent, and reduced scrap loss almost completely, with a new four-ton press setup.

In the operation, markings are put on two types of timing gears. Numbers

**Marking of timing gears . . .** was increased 800 per cent when a press was substituted for manual labor.



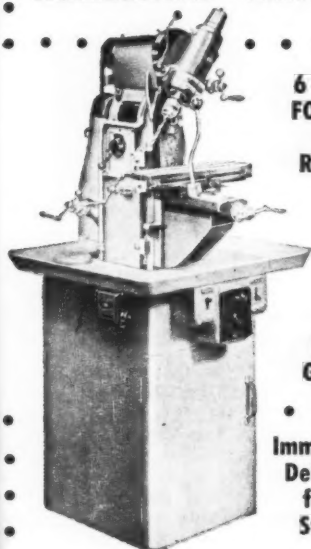
are stamped on the outer tooth ring of metal gears, and on the metal center hub of micarta gears. Also, timing marks are placed on the outside rim of the micarta gears with a highly accurate, uniform pressure that will not damage the gear, but which will mark it clearly and sharply.

Until the time when the press made it practical to do the marking and stamping with a machine which could be manually operated, yet accurately controlled, the operation was done with a hammer and hand punch. This resulted in considerable scrap loss, since the stamping impact could not be kept precise on each gear.

In marking the micarta gears, ink in the die head feeds down two small holes into the pads on either side of the marking punch. This brackets the actual timing mark by two ink marks so the proper teeth can be easily located. The punch is firmly held in the die by a set screw through the die head. There is also an air hole in the die which allows the ink to flow freely down to the pads.

A Numberall tool is used to stamp numbers on the cast iron gears. The ram is set at a  $\frac{1}{4}$  inch stroke length. This does a faster job because there is practically no ram travel, and the

**COMPARE THE NEW  
CENTEC 2A  
PRECISION  
UNIVERSAL  
MILLING MACHINES  
MADE IN ENGLAND  
BENCH AND PEDESTAL  
TYPE  
HORIZONTAL - VERTICAL**



**6 SPEEDS  
FORWARD  
AND  
REVERSE**

**FULLY  
GEARED**

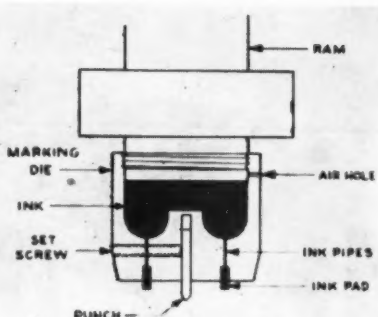
**Immediate  
Delivery  
from  
Stock**

Made in England, these precision built machines are specially designed for short runs of small and intricate parts to close tolerances, which can be machined by horizontal and vertical milling, drilling and boring.

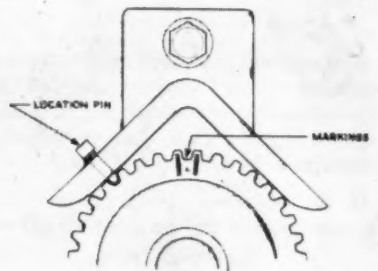
The CENTEC millers are equipped with a 1" arbor, No. 2 M.T., and 3/4 H.P. motor. Available with swivelling table, and swivelling head with sliding spindle for milling at all angles.

Write for full details and specifications . . . and surprising low prices!

**DE WITT EQUIPMENT CO.**  
136 Lafayette St., New York 13, N.Y.  
Telephone: Walker 5-4048



Side view . . . looking at the die, die head and inking device.



Top view . . . looking down on press bed.

smoothly controlled flow of pressure greatly reduces die wear. The short ram travel also provides a safety factor because the operator cannot get a finger caught between the die and the gear. And the oil-smooth, footpedal controlled action overcomes the exhausting strain of the old method. The machine is a Multipress, built by The Denison Engineering Co., Columbus 16, O.

**Taps 100 3.5 rocket body  
pieces per hour**

A number of model E-4U Cleveland lead screw production machines are in various munition plants turning out 3.5 rocket bodies at the rate of 100 pieces per hour. The machines are fully auto-

# COMPARE FOR FEATURES COMPARE FOR PRICE ... you'll choose the **LUCIFER Furnace!**

Pore over specifications and manufacturer's data sheets and you'll end up buying the LUCIFER Furnace every time!

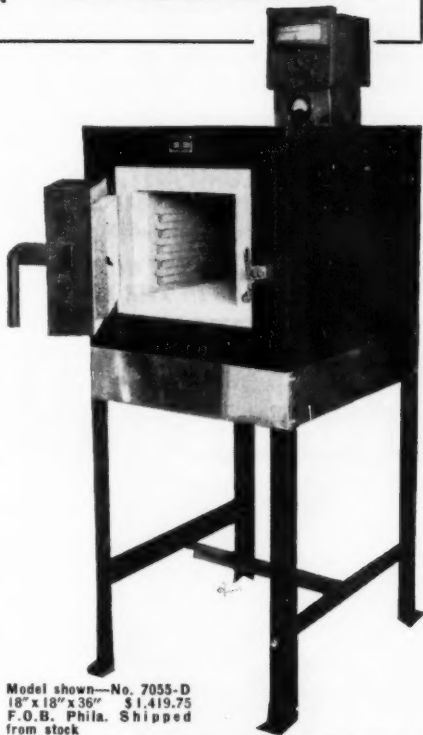
Whether its the Lucifer 6"x6"x12" furnace at \$467.00 or the model shown at \$1,419.75 for 2000' and \$1,629.50 for 2300', LUCIFER represents the ultimate in value.

There's a minimum of 5" of refractory insulation in every model. This is composed for four different types of refractory for greatest protection. Double sealing doors. And the LUCIFER controls are the greatest in the field! Our automatic electronic controls are the simplest, most reliable type. Just dial the desired temperature, throw the switch and your LUCIFER quickly climbs to the desired temperature. Then it stays at that temperature—it can't overheat.

The LUCIFER Electric Furnace is complete—nothing else to buy. Can be in operation within one hour after uncrating!

Write for FREE descriptive literature giving sizes, temperature ranges, K.W. Rating and list of "Blue Chip" users. Prompt attention given all requests for engineering assistance.

2 to 3 weeks delivery!



Model shown—No. 7055-D  
18"x18"x36" \$1,419.75  
F.O.B. Phila. Shipped  
from stock

**GILBERT S. SIMONSKI CO.**  
Precision Machine and Tool Work  
Route No. 611 Neshaminy, Penna.  
Phone: Hatboro 0411  
Sole Manufacturers  
**LUCIFER**  
Electric Furnaces

## HIGH SPEED KNURLS

WE STOCK ALL SIZES REED KNURLS IN STRAIGHT, DIAGONAL AND DIAMOND PATTERNS FOR BOTH LATHE AND SCREW MACHINE HOLDERS.

## DRILL JIG BUSHINGS

LARGE NEW YORK STOCK FOR AMERICAN DRILL JIG BUSHING CO. WE CARRY THOUSANDS OF HEADLESS PRESS FIT, SLIP RENEWABLE, LINERS, AND HEAD PRESS FIT BUSHINGS.

GOOD DELIVERY FOR SPECIAL SIZES.

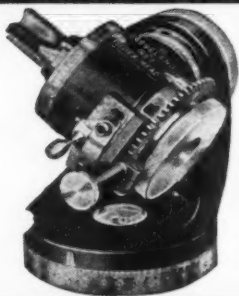
## SID TOOL COMPANY, INC.

126 LAFAYETTE ST., NEW YORK 13, N.Y.

CANAL 6-4946-4947-4735

ONE OF THE LARGEST CUTTING TOOL DEALERS IN THE EAST.

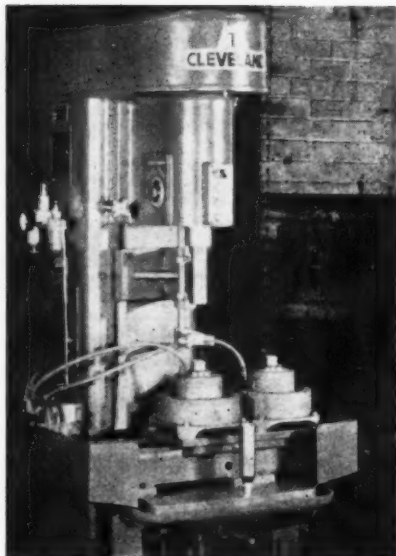
## TOOL HOLDER INDEXING HEADS



Holds 1/16" up to 1 1/2" Tools  
SC or 1AM Collets and Brown & Sharpe or Morse Taper. Will adjust to any compound angle.

## GRINDERS & FIXTURES INC.

8327 Clinton Road Cleveland 9, Ohio



Lead screw production machine . . . set up for tapping 3.5 rocket bodies at a rate of 100 pieces per hour.

matic in operation except for loading and unloading. The fixtures are the shuttle type and are air operated as are the chucks for holding the parts. Cutting speeds of about 34 feet per minute are used. The material used in these parts are 4140 seamless steel tubing, hardened to 35 to 37 Rockwell. The threads are 1 25/32-16 pitch buttress.

FREDDY FEDERAL SAYS:



## Federal SHORT RUN STAMPINGS

FOR YOUR EXPERIMENTAL AND PRODUCTION UNITS

Our Phenolic Stamping Service supplies phenolic stampings for insulators, spacers, terminal boards, gaskets, cams, etc. Any dimension up to 9" x 12" x 1/4". Any quantity from 3 pieces to 20,000.

Write for illustrated bulletin.

Federal

TOOL AND MANUFACTURING CO.  
2610 ALABAMA AVE., ST. LOUIS PARK  
MINNEAPOLIS, MINNESOTA

QUALITY STAMPINGS IN SMALL QUANTITIES





By using a mechanical set-up on a brazing operation . . . one-third was lopped off the cost of producing 500,000 roll backs.

### Mechanizing silver alloy brazing

The trend in silver alloy brazing, where volume production is involved, is toward almost complete mechanization by means of heating equipment

with indexing tables or conveyor lines, by parts positioning through jiggling arrangements and by replacing the silver brazing alloy in wire ring or other prefabricated form. In the example shown here, stamped steel "roll

## A QUIZ ABOUT MATERIALS

by Professor Herman Reichardt, Consulting Engineer

Ten for each one answered correctly. 80-100 is excellent; 60-70 is fair; below 60, . . . hm, you really ought to know this sort of thing; on the other hand you're probably a whiz with steels.

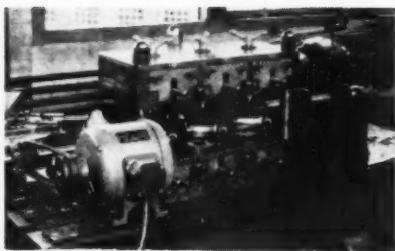
1. Hammering **softens** or **hardens** brass or copper? \_\_\_\_\_
2. Copper and brass are softened by heating then plunging into **hot** or **cold** water? \_\_\_\_\_
3. Amonia joints should be made of **copper**, **iron** or **steel**? \_\_\_\_\_
4. What is the correct sequence as to strength of **cast iron**, **cast steel** or **ferro steel**? \_\_\_\_\_
5. Brazing solder is copper mixed with **lead** or **zinc**? \_\_\_\_\_
6. Kalamine is a composition of **copper** or **lead and tin**? \_\_\_\_\_
7. Malleable iron can be **hammered** or **not hammered** to shape? \_\_\_\_\_
8. What kind of pipe is used for fire protecting system, **cast iron**, **galvanized lead lined steel** or **steel**? \_\_\_\_\_
9. Why is it used: **because of its ability to withstand heat** or **because it is less affected by mineral action**? \_\_\_\_\_
10. Copper and brass pipe is annealed by **natural cooling** or **by cooling in water**? \_\_\_\_\_

Answers to quiz on page 327

backs" for door locks are fluxed and assembled by the operator with a tiny square of Easy-Flo placed between the teeth of the roll backs. After placing three assemblies in each jig, the machine takes over. First, an air cylinder plunger shoots forward, clamping the assemblies in the jig. A movable induction heating coil then drops automatically into position for a 9-second application of heat. The coil goes up and the assemblies ride two stations while the brazing alloy sets. Finally, a second air cylinder plunger ejects the finished assemblies from the indexing table into a shipping crate. With this mechanical set-up one-third was lopped of the cost of producing 500,000 roll backs. Production can be doubled by adding a second heating station and another operator to the present indexing table.

#### Removing waves and bends from tubing

Small Tube Products, Inc., Waterbury, Conn. gets things done in a hurry. A cross-rolled straightener in the Small



A cross-rolled straightener . . . operates at the rate of 550 feet of copper or brass tubing per minute.

Tube finishing department operates at the rate of 550 ft. of copper or brass tubing per minute. This machine removes waves and bends from about 1,000 pieces of 20 ft. tubing per hour.

Tubing straightened on this machine varies in size from 1/4 in. to 1 in.; in wall thickness from .010 to .083 in., and in length from 6 ft. to 24 ft. Despite these variances and their resultant fre-

## The internal gage that's RIGHT for war production conditions COMTORPLUG

Gages precision bores to fractions of .0001"

War production conditions intensify the need for a gage that gives high precision yet is Rugged, Automatically Accurate, "Unrestricted".

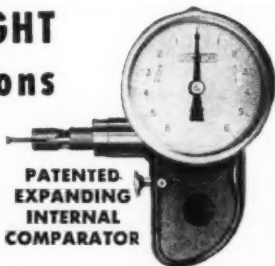
Patented COMTORPLUG answers the need as no other gage can because:

- 1) Withstands typical shop use at machine or inspection bench, without lessening precision.
- 2) Trains equal old hands in precision results, due to automatic alignment and "feel".
- 3) For Quality Control, gives actual measurement, and a fixed—not passing—reading.
- 4) Available anywhere instantly. Weighs but a few ounces. No hose, wire, or "10-ton base".
- 5) Cost is so reasonable as to be practical for all quantity gaging applications. Fits in with other gaging methods. Let it grow as it proves itself—which it WILL!

### COMTOR CO.

62 Farwell St., Waltham 64, Mass.

Request  
"Bulletin  
40"



PATENTED  
EXPANDING  
INTERNAL  
COMPARATOR

1/8" to 8" dia.



Inspection to fractional ten-thousandths of hydramatic airplane propeller distributor valve.

For data on COMTORGAGE Precision External Gage, request Bulletin 30.

## NOTCHING TUBING OR PIPE ENDS EASILY WITH

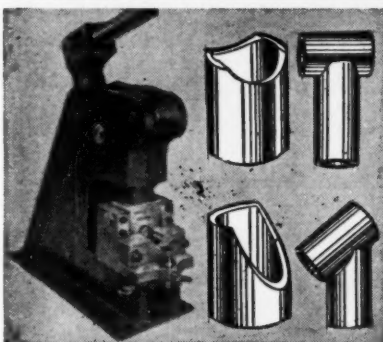
# ARC-FIT \*

Reg. U.S. Pat. Off.

## IN POWER PRESS OR HAND PRESS

Arc-Fit is a notching unit for preparing pipe or tubing ends in making welded or brazed tubular joints. Arc-Fit will prepare the ends of a pipe or tube in less than 5 seconds. Arc-Fit is a production tool that will cut your production costs. It is applicable in any industry where pipe or tubular construction is used.

- Arc-Fit can be utilized in any power press.
- Arc-Fit can be furnished for any size tubing or pipe.
- A hand press can be supplied with Arc-Fit units for shearing pipe or tubing sizes 2 inches or under.



- For sizes over 2", angular cuts other than 90°, and slotting operations. Quotation furnished on request.
- Arc-Fit does not deform pipe or tube. No grinding or finishing operation is needed.
- Engineers can now design for tubular construction and cut costs.

Write today for circular and prices.

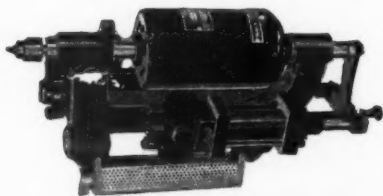
Manufactured Exclusively by

## VOGEL TOOL & DIE CORPORATION

1825 N. 32nd Street

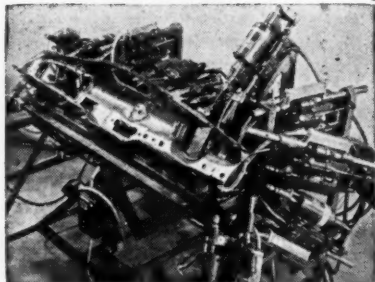
Melrose Park, Illinois

## How to Simplify Production-Precision Drilling of Holes From .004" to .156" Diameter



### USE THESE COMPACT DRILL UNITS FOR SIMPLE OR COMPLICATED SET-UPS

These modern drill units speed-up many simple drilling jobs and simplify complicated multi-spindle jobs. Direct drive variable speed spindle provides speeds from 1000 to 10,000 or 2,500 to 15,000 RPM.



Sixteen Electro-Mechano air feed models electrically interlocked and controlled to drill miscellaneous holes in automobile dash board.

### AVAILABLE WITH AIR OR HAND FEED-VARIABLE SPINDLE SPEEDS

Illustrated is the 8" model with air feed and hydraulic control.

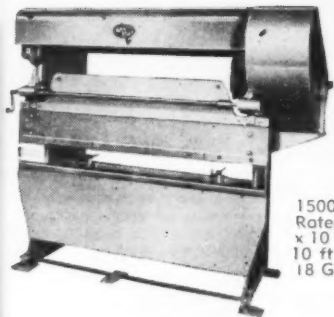
THE ELECTRO-MECHANO CO.

263 EAST ERIE STREET  
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Write for Bulletin BB-650.



## POWER PRESS BRAKE



1500 Series  
Rated 4 ft.  
x 10 Ga. to  
10 ft. x  
18 Ga.

### Lowers Production Costs Through Greater Accuracy

The M/W Press Brake has been designed and engineered to provide greater and more permanent accuracy. There is no chance for human error in construction. The gibbing and all moving parts are machine located in an integral frame. Ram adjustment is through powerful alloy steel screws with opposite buttress threads to equalize thrust loads and lower maintenance costs. Right hand drive power transmission reduces torsional shafting deflection providing permanent accuracy. Anti-friction bearings reduce operating and maintenance costs.

*Write Today* for information on complete range of press brakes and forming dies from 4 ft. x 10 gauge to 12 ft. x  $\frac{1}{4}$ " capacities.

Machinery Division

**AIRTHERM** Manufacturing Company

762 South Spring Ave. • St. Louis 10, Mo.

Serving the Metal Working Industry Since 1931

quent change in machine set-up, the Mackintosh-Hemphill rotary unit enables this plant to meet straightness requirements considerably more rigid than was possible with other straightening equipment.

Of unusual interest is the powered cotton buff seen to the left of the straightener. It was developed by plant manager L. C. Wohlberg. Machine operator applies solvent to tubing to cut the lubricant used in drawing. The solvent, in itself, is a lubricant for tubing as it passes between the rolls. The rotating buff automatically wipes the tube clean and eliminates a manual cleaning of finished product before packing.

The three brakes here shown are set up for a production run to form tapered square legs of 20 gauge steel. More than 450 completed legs are produced each hour using this set up. Three operations are



performed; first fold; second fold; and a closing and swedging operation. The blanks are produced in a press.

## Brazing tubular aluminum

Three distinctly different gauges of tubular aluminum are brazed, with only a 50-degree temperature differential between the flow-point of the brazing alloy and the burning-point of the components, at the rate of 500 assemblies per hour on a special-purpose automatic gas-fired machine produced by Selas Corporation of America. The production rate is ten times the displaced hand-operation.

The two-stage machine has sixteen soft-flame gas burners, each controlled for heat input and placed to give the required brazing-heat patterns. Operator-comfort is accommodated in the first stage by appropriate water cooling. A variable speed control is synchronized with the time-heat requirements at the operations.

The correct combustion mixture of gas and air is supplied at constant pressure to the brazing machine by a Selas Combustion Controller. The installation is equipped with Selas Fire Checks.

The principle of this equipment can



Unit with three different gauges of aluminum . . . brazed on special purpose machine. A. Complete unit, B. first operation (Brazed joints are indicated by arrows).

be applied to brazing operations that require exact control of temperature and area to be heated.



"I can't understand why the screwdriver should break, just because you used it for a chisel."



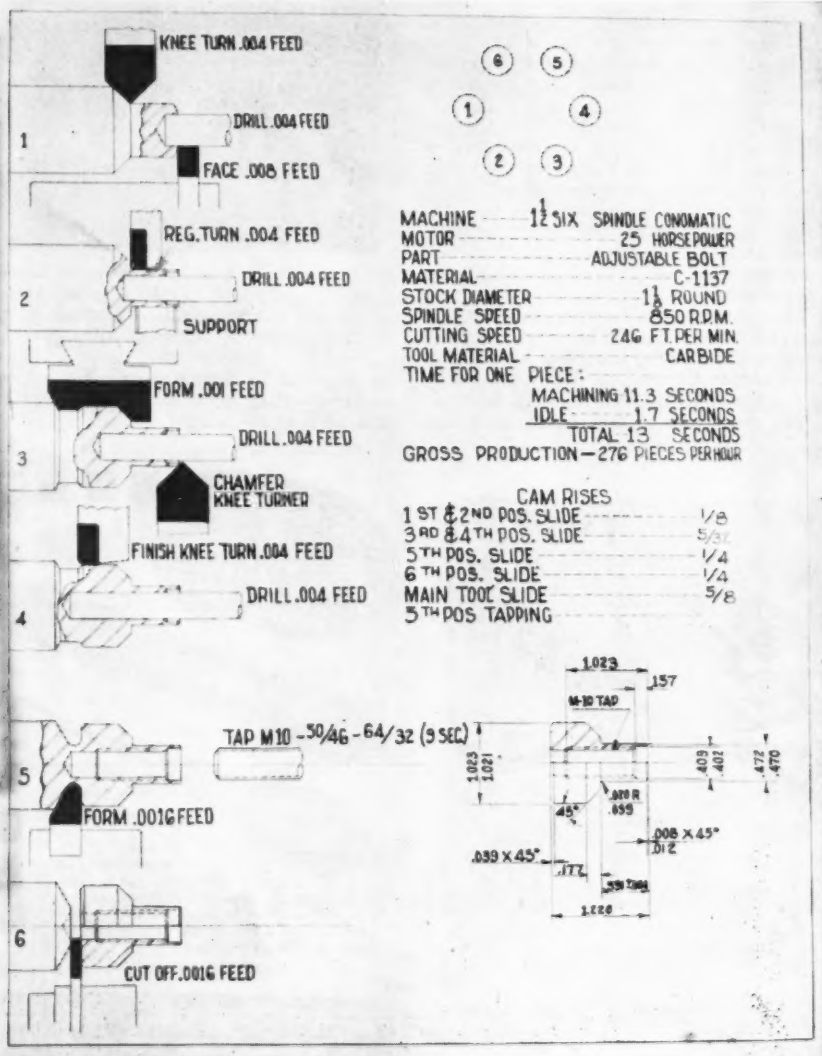



For blowing chips from work — For cleaning out hollow sets, machine recesses and tee slots — For drying parts before inspection and for many similar uses, Air-O-chek is the Air-gun.

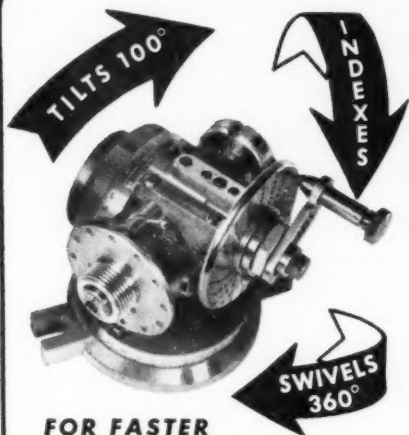
Write for details

**AIR-WAY PUMP & EQUIPMENT CO.**  
1054 N. Kilbourn Ave. Chicago 51, Ill.

**An interesting operation sheet for a six spindle Cone automatic using carbide tools.**







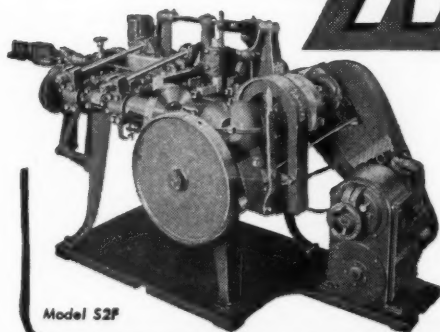
**FOR FASTER  
PRODUCTION!**

## THE *unusual* **ELLIS** DIVIDING HEAD

"Versatile" is the word for the unusual Ellis Dividing Head. This beautifully designed and built unit can extend the profit and production possibilities of your mills, grinders, drill presses and jig borers. It has 6 1/2" swing, or 11" swing when used with riser blocks. Its fully universal action provides every needed setting, so that most work can be completed without rehandling. Work may be held between centers, or in chucks or collets. Write for catalog giving complete details!

**NICHOLS-MORRIS CORPORATION** 50-G CHURCH STREET  
NEW YORK 7, N. Y.

**TRULY—** *THERE'S* **NILSON** *NOTHING LIKE A*



Model S2F

**For Rapid,  
Accurate, Automatic Production**

### • **Combination Press and 4-Slide Forming Machine**

Extra rigid construction; tooling costs are generally lower; forming tools are interchangeable and easy to adjust. Send for catalog.

**A. H. NILSON MACHINE CO.**  
**BRIDGEPORT 5, CONN.**

Automatic Wire and Metal Forming Machines • Staple Forming Machines • Chain Making Machinery • Foot and Power Presses • Wire Reels • Wire Straighteners.

**SPECIALISTS IN WIRE FORMING EQUIPMENT FOR OVER 50 YEARS**

# IT'S THE **Cost per Cut** THAT Counts

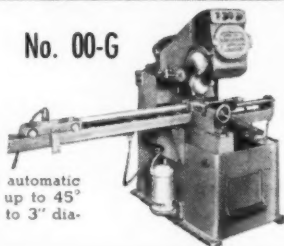
Study these high production, low cost figures on three Match & Merryweather Circular Sawing Machines

Make your own study of the cost per cut in your metal-sawing department. Then find out from Match & Merryweather how much production at lower cost you can get on M. & M. Circular Sawing Machines, using our Triple-Chip blades.

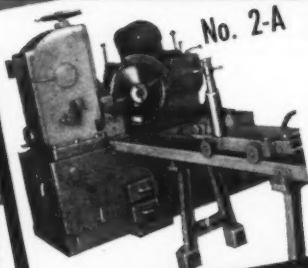


Operation: Steel door frames (mitre cut).  
Material: Rolled steel shapes 6" wide x 1/16" thick  
Production: 200 pieces per hour.  
Tool cost per piece: \$0.002.

M. & M. No. 00-G Circular Sawing Machine. Manual or automatic stock feed. Readily adaptable to making cuts at angles up to 45° as well as high production square cut-off. Capacity: up to 3" diameter round, shapes—up to 3-3/8" x 6".



No. 00-G

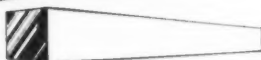


No. 2-A



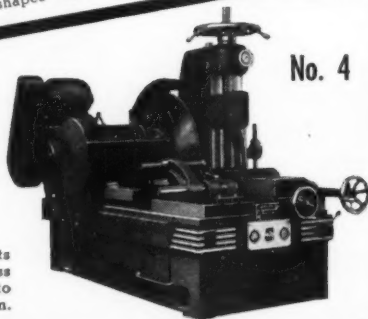
Operation: Rocket nozzle stock cut to length.  
Material: S. A. E. 1020, 5" diameter.  
Production: 60 pieces per hour.  
Tool cost per piece: \$0.001.

The No. 2-A machine pictured at the left has automatic stock feed up to 72" cut-off lengths. It is offered also with manual stock feed. Capacity: up to 6-1/2" diameter round; structural shapes—up to 5" x 12".



Operation: Forging billets cut to length.  
Material: S. A. E. 1045, 14" square.  
Production: 6 pieces per hour.  
Tool cost per piece: \$0.12.

No. 4. Widely used in steel and structural steel plants and forge plants sawing all types of forging, stainless and titanium alloys, die block steel, etc. Capacity: to 17" dia. round; structural shapes up to 24" I-beam.



No. 4

Manufactured by

**THE METCH & MERRYWEATHER MACHINERY COMPANY**  
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Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT



# Shop HINTS



## Protractor Attachment for power shear

### features quick indexing

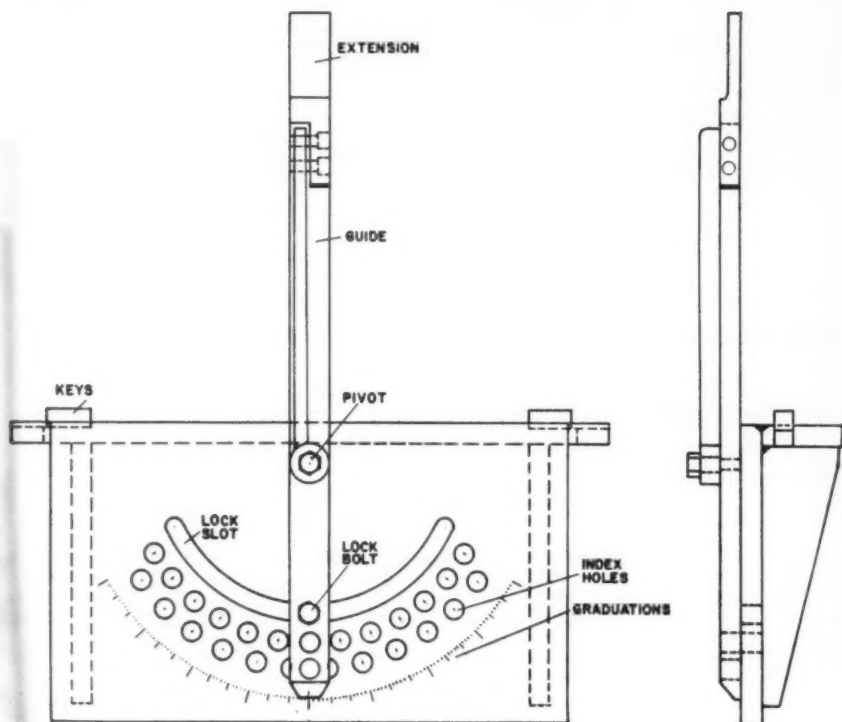
by H. G. Frommer

When shearing gussets or other smaller parts on a power shear, or when making angle cuts on larger plates, it usually becomes necessary to make a set up by bolting a rail to the machine bed. Such set ups are time consuming, inaccurate and often of insufficient strength to withstand the great back

pressures exerted by the shear blades. To overcome these difficulties and to achieve time savings, a quickly adjustable protractor was designed and built.

The main weldment, consisting of two plates at right angles and two gussets was machined square and into it were milled two keyways and bolt slots in such a manner that the top surface was flush with the machine bed when the mounting keys were entered into the keyways of the side of the machine table. The top surface was jig bored with help of a rotary table to give two rows of holes, alternately ten degrees apart, so that finally there was a quick indexing hole for every five-degree position. In order to keep the indexing pin fairly large, it was necessary to resort to the described two-row system rather than keeping all holes in one row. All holes were lined with hardened bushings to minimize wear and assure accuracy. A circular slot was provided for clamping purposes. A bolt with a rectangular shoulder rides this slot and serves as a lock when tightened against the guide. The latter contains





the two master index holes (one for each row) and pivots around a tight shoulder screw. To permit adjustments as fine as degrees and half-degrees, the guide was flattened at the operator's end and was provided with a zero marker. Corresponding marks for each degree were machined into the top surface of the protractor table by use of a centerdrill and the rotary table. This too, was done on the jig bore.

The guide consists of two parts; the guide proper and the extension, which is bolted onto the former. Several extensions were made to permit guidance of the work to within a few inches of the shear blade in various positions of the protractor. Guide extensions are

machined flat and thin at their extreme ends to permit them to slide beneath the low shear blade and hold-down guards.

This protractor has proven itself beyond any doubt within the short time it has been in operation through an 85% reduction of set-up time on a great number of smaller parts. The protractor body is not in the way when large plates are to be sheared, as the guide and pivot may be removed quickly, leaving a flat working area. Longitudinal adjustment of the protractor becomes a matter of loosening of two bolts and sliding the body into any desired position, a job which can be done by one man within a few seconds.



### **A boring attachment**

by Geo. F. Burnley

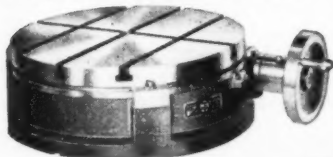
In boring hundreds of center holes in Ice Pans for a large contract, the Leon Hommel Machine Works of Oakland, Calif. made an attachment for a lathe which handled the work nicely.

Rather than mount the boring bar in the tool-post over the compound rest—which would involve reversing the heavy carriage by hand after each bore—a bar was procured which fit into the

tailstock quill. Then, to get a steady, even, feed essential for a smooth job, a large "V"-belt pulley was fastened to the handwheel, and the belt led over a small pulley attached to a 1/3 H.P. motor fastened on a hinged mount clamped to the ways. This motor, in turn, worked through a 120-1 reduction gear, the net result being that the lathe handwheel was powerfully turned at a very slow even speed during the bore. To reverse, the belt was merely slipped off the pulleys by lifting the hinged motor-mount and the quill spun out in the conventional way.

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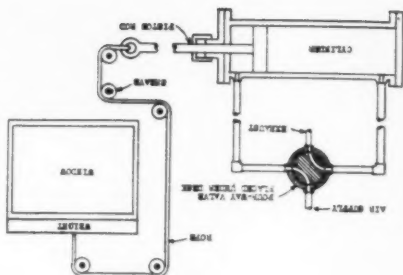


Drilling attachments can now  
be furnished for Worm Wheel  
Operated Tables.

**TROYKE MFG. CO., Inc., Cincinnati 9, Ohio, U.S.A.**

## An automatic window opener

The plant was so noisy that conversation over the telephone was impossible when the window was open. Consequently, the window had to be opened and closed frequently because the chief used the telephone often. The window was opened and closed by a twist of the wrist of the chief himself who simply manipulated a valve located beneath his desk within convenient reach. So the mere twist of the wrist—and compressed air—did it. The chief didn't rise from his chair or even bat an eyelash.



The chief told the boys in the plant to make such a device for him—and they did as per the accompanying sketch—out of old cylinders, valves,

and pipes and fittings that would otherwise have been junked. Modern welding can often do wonders with an old junk pile, as in this instance.

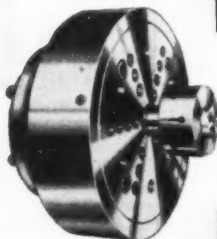
## KNOW ANYTHING ABOUT PIPES?

by Professor Herman Reichardt, Consulting Engineer

Maybe you can pipe-dream yourself to a high score. The usual ten for each correct answer. 50-100 is very good; below 50 is also very good. If you answer none of the questions: don't worry . . . who cares about pipes anyway?

1. A  $\frac{1}{8}$  bend is **135, 80** or **45** degrees? \_\_\_\_\_
2. In fittings, back outlet eccentric is **an outlet in mid center of length** or **not in mid center**? \_\_\_\_\_
3. An Armstrong joint is for **high** or **low** pressure? \_\_\_\_\_
4. A bleeder valve is designed to **reduce pressure** or **remove condensation**? \_\_\_\_\_
5. A check valve **controls** or **directs** flow of liquid? \_\_\_\_\_
6. A saddle flange is **square** or **curved**? \_\_\_\_\_
7. A dished cylinder head is **concave** or **convex**? \_\_\_\_\_
8. Extra heavy fittings are suitable for **300, 250** or **150** pounds pressure? \_\_\_\_\_
9. A grummet is a **wire bristle brush** or **frayed end of rope**? \_\_\_\_\_
10. A riser is a vertical pipe **with** or **without** outlets? \_\_\_\_\_

Answers to quiz on page 298



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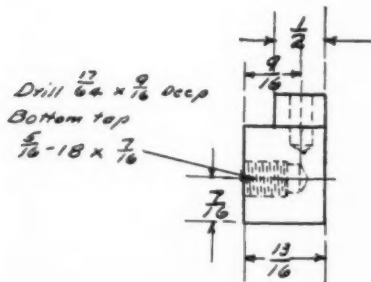
## An inexpensive quick-acting drill jig

by Robert Mawson

When designing simple drill jigs the importance of quick-acting locating and holding features is sometimes overlooked. The tool may machine the various holes accurately but it would be more efficient as a cost-reduction piece of equipment if quick-acting features had been incorporated in the jig instead of the time wasting details which are sometimes used. The ideal drill jig is one where the lost time is the smallest percentage of the total, in and out, period.

In figure 1 is shown a detail, made from  $\frac{7}{8}$  inch square rolled steel, which is one of the parts used on grinders built by the Norton Co. When producing this detail two of the sides are first machined to a width of  $\frac{13}{16}$  inch and a .374-.370 inch tongue is machined for a depth of  $\frac{5}{16}$  inch.

The next operation is drilling and then tapping a  $\frac{5}{16}$ -18 hole and also a  $\frac{17}{64}$  inch hole and the jig used for this purpose is illustrated in figure 2. This jig is made with a steel body (1) which is finished all over. On the body is fastened with two socket head screws (6) a machine steel, case hardened, block (2). In this detail has been machined a groove, for the entire length, to be a good sliding fit for the .370-.374 inch machined tongue on the workpiece.



In the upper flange of the jig body, is drilled and reamed a hole in which is inserted a tool steel, hardened and ground, bushing (5) which is provided with a hole suitable for guiding a  $\frac{17}{64}$  inch drill. It will be noticed that this bushing extends into a machined hole in the block (2) in order to guide the drill nearer the workpiece. In a machined boss on the jig body is drilled and reamed a hole in which is placed a tool steel, hardened and ground, liner bushing (9). To have a good sliding fit in the liner the jig is provided with a tool steel, hardened and ground, bushing (7) with a hole suitable for guiding a  $\frac{17}{64}$  inch drill. To hold the bushing from rotating during the machining operation the jig is fitted with a lock screw.

In the jig body is reamed a  $\frac{1}{2}$  inch hole in which is driven a machine steel pin (10). This pin is machined with a  $\frac{5}{8}$  inch portion to suit a reamed hole in the machine steel rocker arm (3). At right angles in the rocker arm have been drilled and tapped two holes in which are placed  $\frac{3}{8}$ -16 steel socket head screws (4). In the outer end of each screw is machined a slot to facilitate moving the screw.

To use the drill jig, the rocker arm

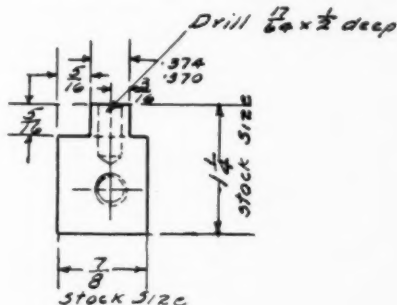


Fig 1.

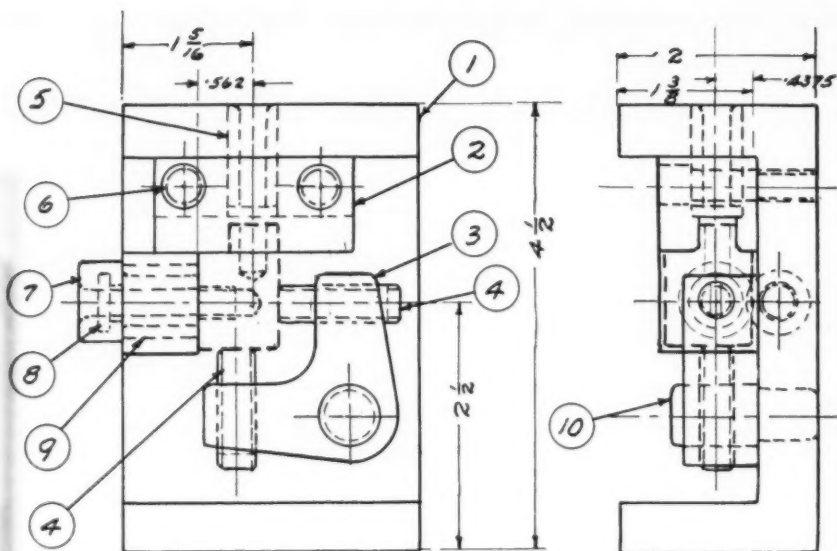


Fig 2.

(3) is first removed from the pin (10). One of the workpieces, to be machined, is then placed in the jig with the tongue setting into the groove in the block (2). The rocker arm is now replaced on the pin and the horizontal socket head screw (4) is screwed inward. This action causes the rocker arm to rotate and to bring the vertical socket head screw in contact with the workpiece. Therefore, the single movement of one detail brings both socket head screws (4) in contact with the workpiece and moves it both horizontally and vertically the two locating surfaces of the jig body.

The piece is now accurately located and securely held for the machining operations. The machine can now be started in motion and with the jig in the position as shown and resting on the machine table a  $17/64$  inch hole is machined in the piece to a depth of  $1/2$  inch, the drill being guided through the bushing (5).

The drill jig is next rotated until the right hand surface rests on the machine

table. In this position a  $17/64$  inch hole is machined in the piece for a depth of  $9/16$  inch, the drill being guided through the bushing (7). The lock screw (8) is then rotated until the guide bushing can be removed from the jig. The drilled hole is then tapped with  $5/16-18$  threads for a depth of  $7/16$  inch, the tap passing through the liner bushing (9).

To remove a finish machined workpiece it is necessary only to screw back the horizontal socket head screw (4) for a short distance. This permits the rocker arm to be free so that it can be taken off the pin (10). When the rocker arm has been removed the piece can be moved out of the groove and away from the drill jig.

This inexpensive tool locates the work positively and also holds it securely with the single manipulation of a quick-acting feature. The drill jig is therefore a good example of a well designed, low manufacturing cost, piece of machining equipment.

### **Drilling and boring time reduced from 26 hours to 1 hour**

A reduction from 26 hours to one hour and five minutes in the time required for drilling and boring holes in the main wing compression ribs of the world's fastest bomber, the Boeing B-47 Stratojet, came about recently through the combined inventive efforts of two foremen in Boeing Airplane Company's Wichita, (Kans.) Division.

While perfecting this technique, the men hit upon a second successful plan which enables the shop to complete another drilling and boring operation six times faster than was possible under the old method. Bob Wilburn, general foreman of production machines, and Bill Geist, second shift foreman in the same shop, demonstrated conclusively the old adage of "two heads are better than one" in perfecting the new system.

The first of the twin inventions has

to do with drilling and boring two giant size bolt holes in either end of each B-47 compression rib. Two of these ribs join the wings to the Stratojet's fuselage.

This precision work formerly required the use of 8 separate tools and took 26 hours to complete. Only nine tools are now used to finish the job and the time required is slightly more than one hour. In part, this is accomplished through a method devised by Wilburn and Geist whereby both right-and left-hand ribs can be worked in the same jig fixture, thus saving set-up time.

The second invention speeds up drilling and boring 13 important close-tolerance holes in each B-47 compression rib. This operation formerly required 35 different steps—and a different tool for each one. Also, the old method required slip-removal bushings for each operation and there was always

**Seven tools at right . . .** take the place of 35 in drilling and boring the 13 holes in B-47 wing compression ribs for wing stiffener fitting at Boeing Airplane Company's Wichita, (Kans.) Division. Bill Geist (left) points out some of the 35 tools formerly used, while Bob Wilburn (right) shows with pride the seven tools the pair devised to speed up and streamline the wing rib operation. Remainder of the tools formerly used has been discharged.



the possibility of using the wrong bushing and drilling an oversize hole.

Now these 13 wing stiffener holes are drilled and bored six times faster by using only seven combination drilling

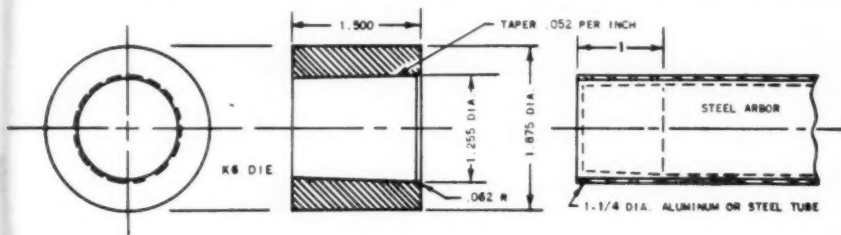
and boring tools. Any chance of drilling an oversize hole has been eliminated by the use of permanent press fit bushings, the size of the finished hole installed in the drill jig fixture.

### Die cost reduced over 90%

The Eureka Williams Corp., of Bloomington, Ill, heretofore used a conventional steel die to taper the ends of 1 1/4" dia. tubes; some steel, but mostly aluminum. Frequent galling made it necessary to stop production for one-half hour each day to polish the die. After

every twenty days (160 hours) of operation, during which 12,000 pieces were tapered, production had to be halted for installing a new die.

A carbide K6 die (see dwg.) on this same job has run for 480 days (3,840 hours) and produced 288,000 pieces without need for any polishing to date.



### COMPARATIVE COST AND PERFORMANCE DATA

#### Steel Die

Production (total life) .....	12,000 pcs.	
No. of hours in operation .....	160 (20 days)	
Cost of Die .....		\$ 10.00
Polishing Cost 1/2 hr./day @ \$1.55/hr. ....		15.50
Cost to produce 12,000 pcs. ....		\$ 25.50
Cost to produce 288,000 pcs. ....		\$ 612.00

#### Carbide K6 Die

Production (to date) .....	288,000 pcs.	
No. of hours in operation .....	3,840 (480 days)	
Cost of Die .....		\$ 51.40
Polishing Cost (to date) .....		00.00
Cost to produce 288,000 pcs. ....		\$ 51.40
Savings with K6 die to date .....		\$ 560.60

To produce 288,000 pieces with steel dies would require 24 dies at \$10.00 each or a die cost of \$240.00. The polishing charge for 480 days of operation would have been \$372.00 (1/2 hr./day at \$1.55/hr.) for a total die and polishing cost of \$612.00.

Since the cost of the K6 die at time of purchase was \$51.40 and it has not

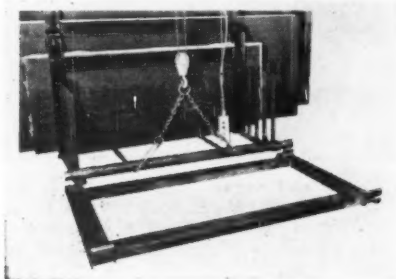
required any polishing to date, it has already saved the user \$560.60.

The non-galling properties of the K6 die plus longer ultimate life provide even greater savings since equivalent production with steel dies would have required costly machine down time for 24 die changes. K6 carbide die was made by Kennametal, Inc., Latrobe, Pa.

## New stock handling system: sheet metal "pages" stored in "books"

A novel and more efficient method of storing sheet metal stock as "books" in a "library" has been developed at Pratt & Whitney Aircraft, East Hartford, Conn. The system, much more satisfactory than conventional flat storage of sheets, will result in a 90 per cent saving in the man-hours required for handling the vast quantities of sheet metal stock used by P & W A in its production of turbojet and turboprop engines, according to William P. Gwinn, general manager.

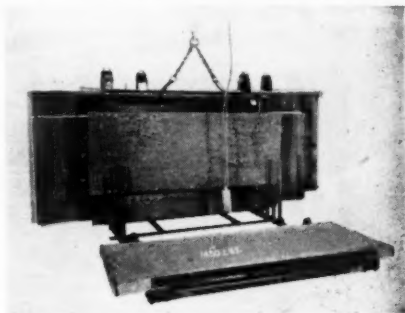
The "library" system was conceived by Herve A. Lessard, supervisor of intra-plant material movement at P & W A's main factory at East Hartford. He says he got the inspiration for storing metal sheets as "pages" in a "book" from an ordinary pocket-sized memorandum book he carries, with leather covers and a paper pad filler.



1. Here's how a "book" starts . . . this transfer rack is placed on the floor to hold the shipping crate in which the sheet metal is received at the plant.

The storage and "finding" problem arising from large stocks of sheet metal in a wide variety of compositions and thicknesses is particularly acute at P & W A. The manufacture of P & W A's several Turbo-Wasp engines calls for sheets of 14 different alloy steels, 11 different aluminum alloys, and nimonic alloy (80% nickel, 20% chrome), in a range of thicknesses running from .018 of an inch up to one-quarter of an inch. The problem is fur-

ther complicated by the fact that each gauge and composition comes in a variety of sheet sizes, giving a total of 355 different combinations.

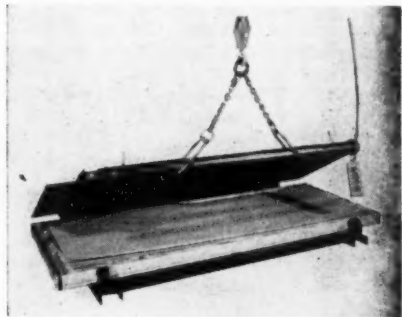


2. Vendor's crate is placed on rack . . . and top of crate is removed. Steel channel which forms baseplate or "backbone" of book is hooked into rack (foreground).

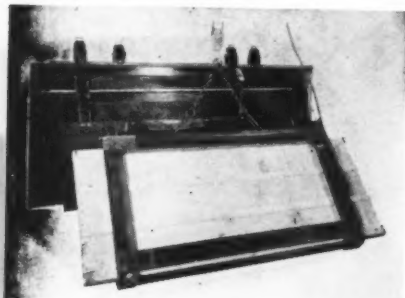
In the new "library" system of storage developed by P & W A from Mr. Lessard's idea, there is at least one "book" for each of these combinations. Each "book" holds a maximum of 1,500 pounds, and there is space in the "book-case" for 475 of these books.

When a new crate of sheet metal

3. The plywood sheet . . . reinforced with a steel frame, which forms one of the "covers" of the book is lowered on top of the opened crate. It has been attached to backbone of the book (at rear). (This picture was taken from the opposite direction to No. 2.)



stock is received at P & W A, it is placed on a welded steel transfer rack. An overhead crane supplies all the "muscle"; none of the handling of sheet metal is done by hand.

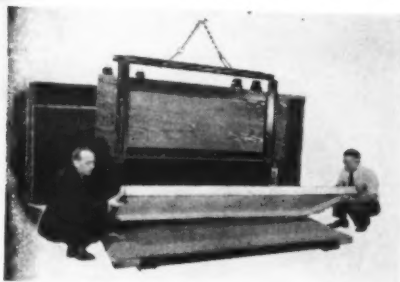


4. The transfer rack . . . crate, and first cover are flipped over by a sling.

The top of the crate is removed and one of the "covers" of the book—made of heavy plywood reinforced with steel—is laid on top of the opened crate. This cover is hooked onto the steel channel which serves as the hinge or "backbone" of the book.

Then the rack, together with the cover and backbone, and the crate of sheets, is turned over by the overhead crane. The rack is then lifted off, the rest of the shipping crate removed, and the second "cover" laid in place and attached to the backbone. Now the book is complete and ready to be transferred to its proper place in the vertical stor-

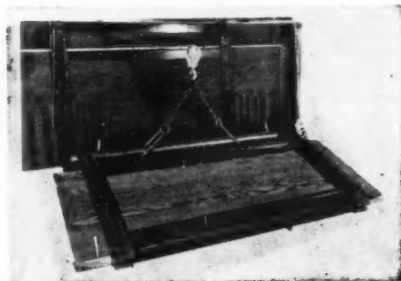
5. The transfer rack is lifted . . . off and the rest of the shipping crate is removed.



age rack, of welded steel members, until the sheets are needed.

Finding a supply of sheets when desired is a simple task, with the new "library" system. Test samples can easily be taken of a particular grade of stock: the "book" is merely lifted from the storage rack and placed in a "V"-rack, much like the bookstands used to hold heavy dictionaries. The sides of the "V" are at an angle of 70 degrees, so that the covers open out and the desired specimen can be removed.

When the factory calls for a supply of the stock, the entire book can be carried to the shears or presses, the needed material removed, and the remaining "pages" carried back to the library, still in their covers.



6. The second cover . . . after being attached to the backbone, is lowered over the sheets. Now the book is complete—two covers, backbone, and "pages" of sheet metal.

Because the sheet metal in the books of the library is handled entirely by mechanical means, the highly finished surface of the stock is protected from the costly damage that results from frequent manual handling. Vertical storage, moreover, means a 50 per cent saving in floor space over flat storage, and eliminates the chance of scratching the sheets that often happens when stock stored flat is stacked and re-stacked in getting out the desired supply of sheets.

Mr. Lessard has been granted a patent on the "library" design.

The End



# AVAILABLE LITERATURE

OCTOBER, 1951

**Catalogs, bulletins available**

**from manufacturers**

**. . . books, films**

**1. Precision Piston Grinder** grinds cam shaped pistons on a high production basis. Adjustment is provided for varying the amount of eccentricity of the piston. Bulletin describing this 5" x 8" Type H grinding machine available from **Landis Tool Co., Waynesboro, Pa.**

**2. "3M Barrel Finishing,"** 12-page booklet, tells what barrel finishing is, who can use it, and what specific advantages it offers. Gives new applications for "Honite" and "Super Honite" abrasive chips, "Honite" compounds developed specifically for barrel finishing, and new 3M barrel finishing equipment. **Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.**

**3. Shear Selector Chart** recommends knives for the types and thicknesses of material to be sheared. Knife settings or mountings for shearing different thicknesses of metals are given in easy-to-read tables. Illustrations show horizontal and vertical clearances. **Simonds Saw & Steel Co., Dept. A, 470 Main St., Fitchburg, Mass.**

**4. Sheet Metal Calculator** determines weight of steel, aluminum, iron, copper, bronze and lead sheets. By setting the thickness opposite the width, the weight will be opposite the length. Obtainable from the **Dayton Rogers Mfg. Co., 2824 13th Ave., S., Minneapolis 7, Minn.**

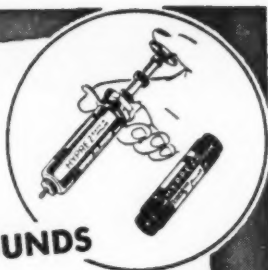
**5. Optical Positioning Equipment** is described in 12-page illustrated catalog No. 10. Catalog shows how accuracy of positioning and linear measurement in machining operations and inspection can be increased. **F. T. Griswold Mfg. Co., Wayne, Pa.**

**6. Power Screw Driver** is described in booklet explaining its advantages and application. Detailed drawings illustrate application, installation and outstanding mechanical features of this screw driver, said to drive up to 60 or more screws per minute. **Shakeproof Inc., 2501 N. Keeler Ave., Chicago 39, Ill.**

**7. "Diecarb—Grades, Applications, Design and Maintenance"** is a new technical data publication covering the use of sintered carbide in blanking dies. 16-page booklet contains Diecarb grade selection information and formulae for computing the physical requirements of sintered carbides used for die sections. "Standard" Diecarb sections are listed for punches, perforators, bushings and rectangular sections. **Firth Sterling Steel & Carbide Corp., Dept. MTB, 3113 Forbes St., Pittsburgh 30, Pa.**

**8. Power-Twin Hydraulic Puller** (capacity 17½ tons—weight 10 pounds) is described in an 8-page bulletin showing how the Power-Twin, with its "Center

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Hole" feature, adapts itself to all OTC Pulling systems now in use. Illustrates time-saving methods for installing and removing cylinder sleeves, shafts, gears, wheels and other usages. Owatonna Tool Co., 382 N. Cedar St., Owatonna, Minn.

9. Gage Block Making is the subject of a booklet that covers the manufacture of gage block physical characteristics, gage block fixtures, angle gage blocks and angle gage block applications. Of-

fers information on gage block care and outlines acceptable method for combining gage blocks to fit a given dimension. Webber Gage Co., 12900 Triskett Rd., Cleveland 11, O.

10. American Standard on Tolerances for Ball and Roller Bearings, B3.5-1951, 20-pages, is the second of a series of antifriction bearing standards under development by a committee representing 14 trade associations, technical societies, and the U. S. Army and Navy.

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snap ring and groove dimensions. Copies can be obtained at 75 cents from the American Standards Association, 70 E. 45th St., New York 17, N. Y.

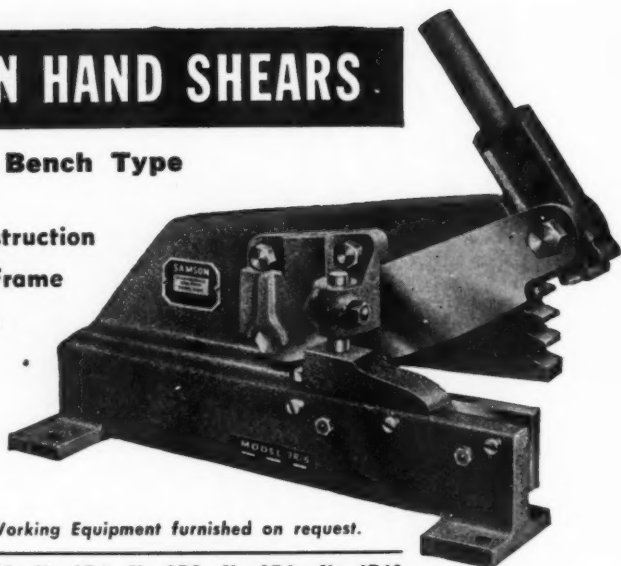
11. Regent Live Centers have a small, free turning point and provide exceptional rigidity due to the stabilizing bearing located in the shank. Shorter overhang eliminates chatter. Accuracy of .0001 is guaranteed. Technical data bulletin may be obtained from Royal Products, 82 Union St., Mineola, N. Y.

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*Established 1910*

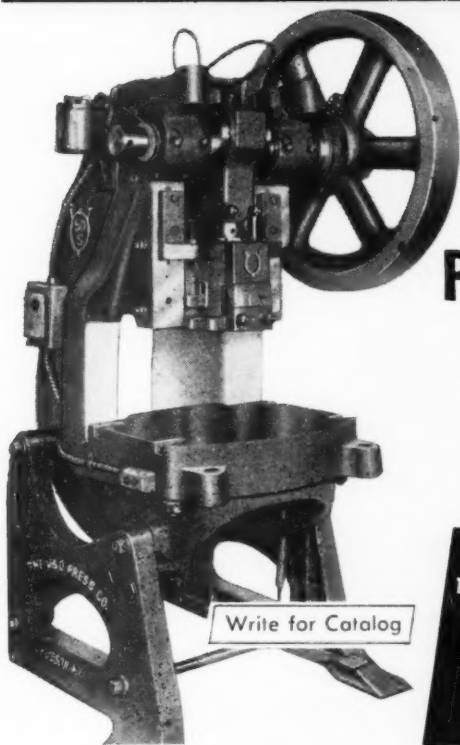
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12. Designed to Aid in Selecting the Proper Visible, Automatic Oiler for constant level, gravity, wick, underfeed, multiple and large capacity gravity feed applications, the 4-page Broadside "Series 4900" contains suggestions on how to eliminate the waste and dangers of "trust-to-luck" hand oiling, how to increase production, reduce maintenance costs, lengthen machine life, etc. Trico Fuse Mfg. Co., Dept. MTB, 2948 N. Fifth St., Milwaukee 12, Wis.

13. "Manual of Welding Engineering and Design," 43-pages, is a technical handbook on the latest developments in welding materials and techniques. Gives detailed information on the newest advances in Eutectic low temperature welding alloys, with special reference to applications for defense production and maintenance. Eutectic Welding Alloys Corp., Technical Information Service, New York 13, N. Y.

14. Universal Hydraulic Grease Fittings,

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couplers swivel couplers, control handle for boosting grease pressures to 12,000 lbs., and top oiler for upper cylinder lubrication are illustrated and described in the 14-page 1951 Industrial Catalog published by Universal Lubricating Systems, Inc., 856 Allegheny Ave., Oakmont, Pa.

**15. Precision Milling, Boring and Grinding** is offered by the Versa-Mil, which can be combined with machine tools or work-holding fixtures for use in

production machining and in maintenance and experimental shops. Wide range of speeds and angular positioning are possible. Photographs of applications, and detailed descriptions with specifications and performance data given in 22-page Bulletin No. 8. Versa-Mil Company of N. Y., 30 Church St., New York 7, N. Y.

**16. "How to Run a Drill Press"** contains sections covering care, operation and maintenance, includes illustrations giv-

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ing the name and function of all important parts and correct adjustment of each unit. Best methods for mounting and removing chucks and tools are explained and the best practices for laying out and setting up work are discussed. Includes special classes of work, such as boring and sanding parts, drilling through glass, polishing and buffing, surface finishing, use of mortising attachment, vise, etc. Contains 32-pages and more than 75 illustrations,

available for 25 cents from the **South Bend Lathe Works, South Bend 22, Ind.**

**17. Hand and Foot Valves** are the topic of Bulletin No. 303 which includes installation data, engineering drawings and explanations of interchangeability of parts and ease of modification. The 880 series was developed for quick control of small cylinders and for pilot operation of master valves. **Ross Operating Valve Co., 120 E. Golden Gate Ave., Detroit 3, Mich.**



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**19. Drill Jig Bushings**, 4-page catalog showing types and sizes, technical information, drill sizes with their decimal

equivalents and price list is available from the **American Drill Bushing Co., Inc.**, 5107 Pacific Boulevard, Los Angeles 58, Calif.

**20. Screw Drivers**, nut setters, sanders, drills, grinders, rammers, chippers and scalers are listed in this 43-page illustrated catalog No. 38. Includes specifications and application photos. **Rotor Tool Co.**, 17325 Euclid Ave., Cleveland 12, O.

**21. Bandsaw Machine Accessories**—micro-precision guides, quick-change

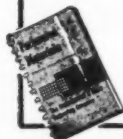


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tires and rigid wheels, Jiffy tires, and the Carter Guide Line Light for straight line sawing—are described and illustrated in a folder available from **Carter Products Co., Inc.**, 55-MT Mt. Vernon Ave., N. W., Grand Rapids, Mich.

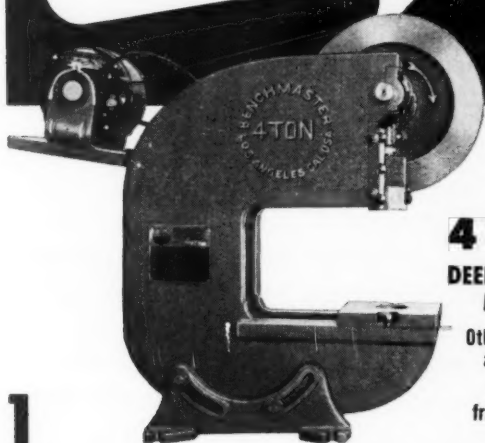
**22. Steel Bar Stock**, cold drawn in special sections to fit specific purposes, is described in 4-page bulletin AM-100. The pre-shaped feature eliminates many machining operations in the production of steel parts for machines and

other products; in some cases, machining may be reduced to a simple cut off operation. **A Milne & Co.**, 745 Washington St., New York 14, N. Y.

**23. Ball Bearing Catalog** simplifies the selection of bearing type and size for various conditions of load and speed. Load rating tables give both radial and thrust capacities for all bearings except those types which are designed for certain specialized services. **New Departure Div.**, General Motors Corp., Bristol, Conn.

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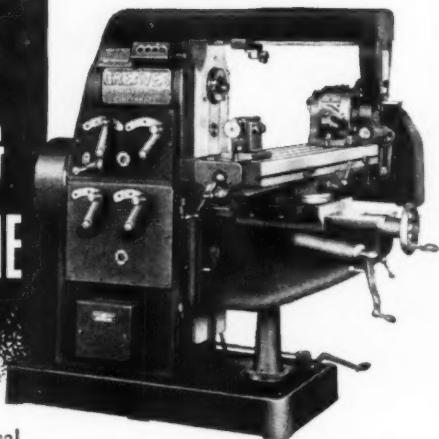
24. Gaging and Inspection of Threaded Parts is the featured article in "Die Headlines," Vol. III, No. 9. Explains "go" gages and "not go" gages and their uses, angle error, wear and care of gages, plus a section on visual inspection. Illustrated 4-page bulletin available from the Eastern Machine Screw Corp., 140 Truman St., New Haven, Conn.

25. High Speed Steel or Carbide Tipped Camlock Serrated Blade Reamers 8-

page illustrated catalog describes both the shell and shank type reamers for use in reaming operations where both high production and accurate finish are required. Circular No. 507-1 available from Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.

26. Testing Instruments, such as the volt-ammeter, wattmeter, power-factor meter, recorders, phase-sequence indicator, etc., are described and illus-

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trated in a 16-page catalog. Instruments for the measuring of magnetic fields, welding cycles, resistance, speed, viscosity, and roughness are shown. Includes an instrument selection chart. **Apparatus Dept., General Electric, Schenectady, N. Y.**

**27. The Bradley Wire Twister**, screw assembly machine, foot operated press, hand press, double "V" wire stripper, wire cutter and rubber wire stripper are illustrated in a descriptive folder which may be obtained by writing **I. H.**

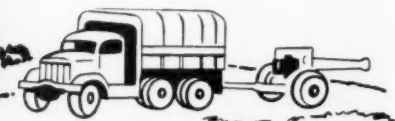
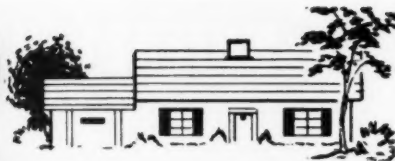
**Bradley & Son, 290 Fifth St., Bridgeport 7, Conn.**

**28. The Cri-Dan Semi-Automatic, High-Speed Threading Machine** has a 4-movement cycle comparable to the fundamental principle of a screw cutting lathe; the cutting tool is traversed through the cut at speeds up to a hundred passes per minute, the number of cuts made by the single point is readily predetermined and set by means of a dial. Available from the **Lees-Bradner Co., Cleveland 11, Ohio.**

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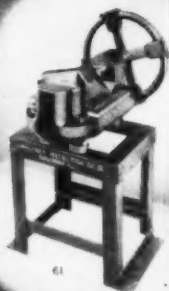
**29. Arc-Fit** is a shearing process for notching the ends of pipe or tubing, requiring seconds instead of minutes in the production of welded or brazed tubular "T" or angle joints. The unit consists of a housing and a set of dies and is suitable for operation in any punch press or punching machine of sufficient capacity with a die space of at least 6" high. **Vogel Tool & Die Corp.**, 1825 N. 32nd Ave., Melrose Park, Ill.

**30. Helpful Hints on Grinding Wheel Problems**, an attractive 64-page, 6"x9" brochure offers a complete survey of pertinent facts of interest and help to grinding personnel. Manufacture and uniformity of wheels is brought out; suggestions for better grinding finishes and greater production are given; emphasis of safety precautions is stressed. Wheel speed recommendations are made. **Macklin Company**, 5818 W. Division St., Chicago 51, Ill.

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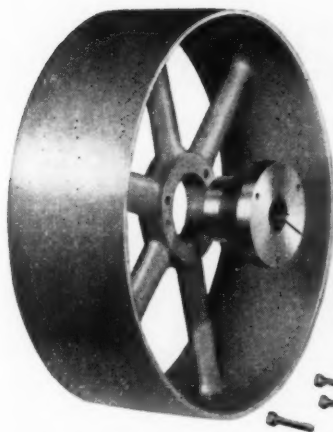
By A. P. Gwiazdowski, M. E., Professor of Industrial Engineering, Tri-State College. Published by C. C. Nelson Publishing Co., Appleton, Wis. 1951. 320 pages, \$6.00.

The author has emphasized in this volume the need of a knowledge of engineering metallurgy in order to select the proper material and their

treatments with a view towards high quality products. Such basic metallurgical information about the nature and characteristics of the commercially important metals and their alloys is of great importance not only to engineering designers but also to purchasing agents, production executives and to engineering students.

Mr. Gwiazdowski has five objectives in view; namely, concise and clear definitions, principles, selection of ma-





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terials, selection of heat treatments, and engineering specifications. The book opens with a discussion of metals and their properties with the following two chapters dealing with structures and compositions of ferrous alloys, and the properties, alloy compositions and uses of a number of metallic elements, metal-loids, and the gases hydrogen, nitrogen and oxygen. Other chapters are concerned with such subjects as various steel-making processes, rolling, various steels and their uses, heat treatment,

high-speed and tool steels, corrosion and heat resisting steels, processing rolled steels, cast irons and cast steels.

### **Machine shop methods**

By Lorus J. Milne, University of New Hampshire. Published by Prentice-Hall, Inc., New York. 1950. 376 pages.

This basic shop book is written for those interested in a practical understanding of hand and machine tools and their proper uses. It serves as an ideal text for students in trade and



- SAVES TIME in jig and fixture operations
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The new Bellows HAN-D-AIR CLAMP is a spring return, single acting miniature air cylinder. 1½" bore develops 100 lbs. of pressure at 100 lbs. of air. (Power factor 1 to 1). 1" stroke. Threaded ⅝" diameter piston rod. Universal mounting; can be mounted horizontally, vertically, side, front flange, rear flange or front pivot. Overall size 4" long by 1½" square. ⅜" heavy wall brass cylinder; ⅝" heads, oil resistant "U" cup; tension balanced spring.

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technical schools and in college engineering courses.

The text includes a discussion on why each machine is used in a certain manner as well as a description of the basic principles of design and constitution. Unique illustrations help to emphasize important details that are often lost in the usual photograph or drawing. With this book the beginner may proceed confidently through the successive phases, and become a thoroughly proficient machinist.

### Gear cutting practice

By Fred H. Colvin, Editor Emeritus, AMERICAN MACHINIST and Frank A. Stanley, Formerly Editor, WESTERN MACHINERY AND STEEL WORLD. Published by McGraw-Hill Book Co. Inc., N.Y., 1950, 3rd edition. 532 pages. \$4.75.

A practical guide to gear cutting methods and standards, this manual includes a wealth of descriptive data on all aspects of gear cutting practice in shops of any size. It explains the

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A normal increase from 300 slotted contacts per day to over 1,200 per day.

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methods used by leading shops in handling various gear jobs, as well as various types of gears, setting up and operation of machines for producing them, cutting and finishing methods, etc.

To this edition has been added new data on carbide-tipped hobs, hobbing speeds and feeds, bevel-gear standards, methods of cutting bevel gears, involute splines, shaving and lapping methods of finishing gear teeth, and inspection methods.

Newly designed gear - cutting and

finishing machines as well as new methods of checking the accuracy of gears have improved the quantity and quality of gears. In this volume the authors describe these new machines and explain the new methods, which information should prove of considerable value to those who must produce accurate gearing.

The latest standards adopted by the American Standards Association and the American Gear Manufacturers Association are also given.

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## New Industrial Films

### The dial indicator

20 minutes running time. 16 mm. Kodachrome with sound. Film is available from Federal Products Corporation, Sales Promotion Dept., 1144 Eddy St., Providence 1, R. I.

This film is one of a set of two pro-

duced by Federal Products Corp. during the last war, and which have again become of interest, due to the present defense situation and the necessity of training many new employees. The film shows in complete detail the principles of direct measuring and precision measuring. It explains the meaning of tolerances, how they are applied to mass production, and how the Dial Indicator is used to check these tolerances.

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CLUTCH AND AUTOMATIC BRAKE RELEASE

FAST EFFICIENT ACCURATE

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CYLINDER TYPE RAMS, ADJUSTABLE BRONZE SLEEVE

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Basically an educational film, this picture has had wide showings; it was assembled primarily, according to Federal Products, "to teach gaging fundamentals and modern gaging practice."

The Dial Indicator mechanism, characteristics, and its practical application are explained. Actual demonstrations are shown in a manner which makes them clear even to new employees. Accuracy of measurement, accuracy of repetition, and sensitivity as required in successful dial indicator applications are all carefully explained. Various

types of Dial Indicators are shown, with demonstrations of their use in everyday toolrooms as well as on the production line. Each step is illustrated clearly, both by animation and actual scenes.

#### Surface broaching

15 minutes running time. Kodachrome with sound. Available from The Lapointe Machine Tool Co., Hudson, Mass.

This film, covering various aspects of the operations accomplished by surface broaching, was made with the coopera-

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tion of several of the country's major industries; it demonstrates the versatility of the broaching process, indicating the wide scope of broaching in the modern production picture.

Highlights of the film include a shot of a single pass of a broach as it machines the bearing surfaces of a Draper loom frame end, so accurately that perfect seating of the bearings is assured without further operations or inspection.

In the fabrication of Stevens-Walden

wrenches, six broaches perform sixteen separate operations to produce a finished product directly from the original forging; this feat is made possible by two ingenious tip-up fixtures.

Mass production of precision parts is exemplified by the broaching of plier halves. Three operations are performed by a single broach. Automobile engine bearings are now broached to such close tolerances that the mirror finish obtained eliminates the need for a "breaking-in" period.



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The assembly line technique in the manufacture of automobile engine blocks is shown; this operation is made possible by a single machine which broaches both 6 and 8-cylinder blocks as they come along the line.

### Grits that grind

30 minutes running time. 16 mm. Kodachrome with sound. Available for showing without charge, upon application to "Grits That Grind," Norton Company, Worcester 6, Mass.

This recently released (May 1951) film on abrasives and grinding wheel manufacture shows in step by step detail, the manufacturing processes from the mining of the bauxite ore in Arkansas to the finished Alundum (aluminum oxide) and Crystolon (silicon carbide) grinding wheels in the Norton Company Plant in Worcester. The film also touches on other Norton products, including grinding machines, refractories, pulpstones, sandpaper, sharpening stones, porous mediums,

# THE BEST FEATURES OF STEEL & CARBIDE ...TO SAVE MONEY ON PRODUCTION DRILLING



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live longer, cost less  
in the long run.

Here is a bushing that combines the best features of steel and carbide; the protection of steel and the long life of carbide. First cost: slightly higher than ordinary steel bushings; their life: many, many times as great. In addition to such obvious savings, MEYCO bushings increase the life of drills and reamers, produce accurate work for a longer period of time, save on machine-down time and on non-productive man-hours.

**PUMP MAKER SAYS:** "We have a jig setup where four holes are held to a limit of plus or minus .0005" on the spacing. After completing 150,000 parts, MEYCO bushings show no sign of wear."

non-slip floors and tile, and wear-resistant products.

The film serves to bring out the careful preparation of Norton abrasives in order to insure the highest of standards of manufacture as well as the final product.

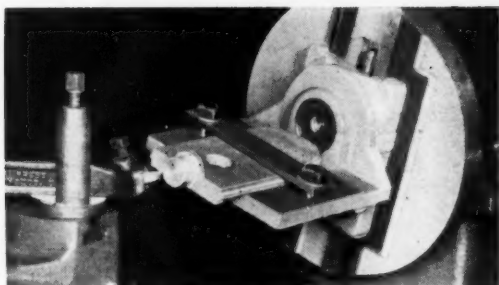
### How DoAll gages are made

7 minutes running time. 35 mm. sound-slide film with records. Obtainable without charge from Clint H. Rosene, Director of

Public Relations, The DoAll Company, Des Plaines, Ill.

This interesting short film covers the manufacture of laboratory, inspection and work gage blocks, demonstrating how they are made to their precision accuracies. This industrial picture brings home to the casual viewer the extent of the patience and high technical skill which is applied in grinding, hardening, polishing, lapping and honing a modern gage block to accuracies within a few millionths of an inch.

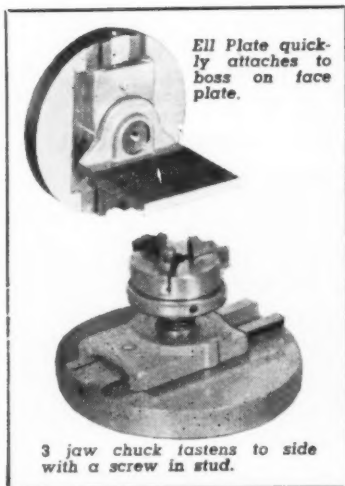
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## ***Saves* TIME and WORK**

Converts your lathe into a boring mill in 60 seconds!  
Enables lathes to do offset turning, or bore three holes  
not in line, without removing work piece.



*Ell Plate quickly  
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plate.*

*3 jaw chuck fastens to side  
with a screw in stud.*

Ell Plate, 3 jaw chuck and MICRO FACE PLATE equip your lathe to do work that formerly required three or more machines.

**MICRO LATHE PLATE, INC.**  
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This MICRO FACE PLATE has boss on an adjustable slide. Ell Plate or any special fixture locks to boss quickly. By moving slide across face plate and rotating fixture on boss, any point of work is brought in exact spindle center.

Boss saves bolting Ell plate to face plate. Work can be clamped to fixture in approximate position without taking time to locate it accurately.

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Meet sudden demands for high speed production by having every lathe equipped with the Allison Collet Chuck. Gives full spindle bore capacity to any lathe having 1½"-8 thread spindles. Requires no keys, wrenches, reverse switching or stopping. Operator simply draws lever ball toward him to tighten collet; pushes it away from him to release. Mail the coupon for complete, illustrated description and prices.

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## News of the Industry

### Independent Pneumatic Tool honors employees

One hundred sixty six employees with a combined service record of 5,038 consecutive years with Independent Pneumatic Tool Co., manufacturers of Thor portable power tools, were initiated into the company's new 25 and 50-Year Clubs in May.

One hundred forty men and women employed in the company's main works at Aurora, Ill., attended the inaugural dinner held at Aurora's Leland Hotel. Also honored but not present at the event were members from various Thor branches across the country.

### Lincoln Electric opens new plant

When Lincoln Electric Company's new plant is put into operation in September, workers, both office and factory, will all enter through this striking brick, glass and aluminum portal and pass through a tunnel which delivers them to their work stations.



As they go through the doors, they will be greeted by a motto on the facing wall, "The Actual Is Limited, The Possible Is Immense." The motto is appropriate here, for this super-modern plant represents what these workers have accomplished through cooperative effort inspired by Lincoln's incentive system.



The above picture shows the fourteen men . . . who represent the June 29 "graduating class" of the Gisholt Balancing School, sponsored by Gisholt Machine Company, Madison, Wis. These men have just completed the required three weeks of instruction and practical work for the Gisholt Type "U" Course. Classes are being held regularly each month for a new group. The first available openings are September 10 and November 5 for two-week Type "S" Course, and October 15 and December 3 for the three-week Type "U" Course.

## COOLEY HEAT TREATING FURNACES

**ELECTRIC BOX TYPE • FLOOR AND BENCH MODELS**  
*For Tools and Small Parts*

**SHOWN HERE**

**THE COOLEY BENCH MODEL  
RECIRCULATING AIR DRAW**



Max. Temp.	Sizes	Price
1250°	10" x 6" x 14"	\$475

All prices are less controls. Any standard controls available for automatic temperature control.

**1. IDEAL FOR**

- aluminum and beryllium copper heat treating.
- closely controlled mild and high-speed steel tempering.

**2. Stainless steel lined chamber.**

**3. Accommodates up to 50 lbs. of parts.**

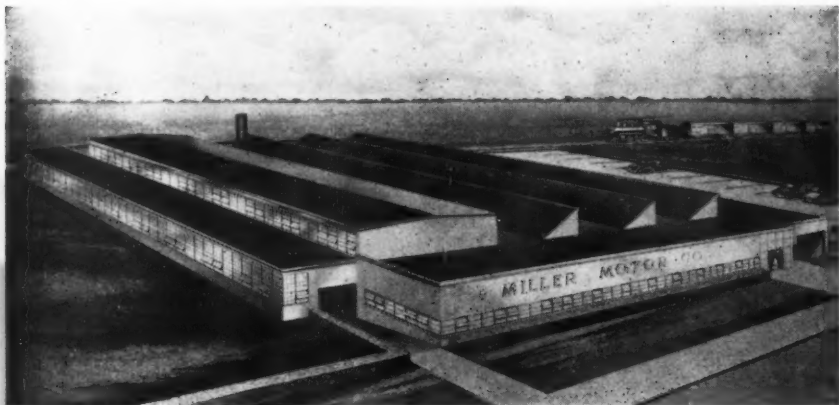
**4. Holds temperature uniformity  $\pm 5^{\circ}$ — $0^{\circ}$ F.**

**5. 4 kw. input at 230 v. assures rapid heating.**

*Brown and Wheelco Control Pyrometer carried in stock—available for all applications.*  
Free on request: ☐ COMPLETE CATALOG ☐ "SHOP NOTES ON HEAT TREATING"

# COOLEY

**ELECTRIC MANUFACTURING CORP.**  
36 SO. SHELBY • INDIANAPOLIS, IND.



### Miller Motor Company opens new cylinder plant

To meet the greatly increased demand for its products, Miller Motor Company, Chicago manufacturer of air and hydraulic cylinders, has built a new, modern plant comprising an area of about 50,000 square feet at Melrose Park, Ill., a suburb within the Chicago metropolitan area.

The new plant represents the very latest in modern plant design and layout and is equipped with the most modern machines and production facilities. Two unusual features of the plant's interior design are: the use of "color dynamics"; and the complete inter-visibility between all departments of office and factory, glass partitions being used throughout to divide the various departments.

Production was scheduled to begin at the new plant on about July 15, 1951 and a welcoming "open house"—with refreshments, plant tours, etc. for visitors—is planned for the following September 15th.

Chain Belt Company of Milwaukee announces the election of **L. B. McKnight** to the newly created position of Executive Vice President of the Company.

Janette Manufacturing Co., Chicago 6, Ill., has recently announced the election of **W. H. SaLee** as vice president; he has been with the firm in various capacities for the past 26 years.

Detroit Broach Company announces the appointment of **J. E. Polhemus** as representative for southern and eastern Wisconsin.



## THE MULTIFORM BENDER

PRODUCES — Springs, Stampings,  
Wire Forms, Brackets, Bus Bars,  
Clamps, etc. AT A PROFIT.

No Special Tooling

**J. A. RICHARDS CO.** KALAMAZOO  
MICHIGAN



H. Glenn Bixby, president of Ex-Cell-O Corporation, Detroit, has announced the election of **Donald H. McIver** to the office of vice president in charge of industrial sales, and **George D. Scott** as vice president in charge of Pure-Pak sales.



Donald H. McIver



George D. Scott

**Ralph W. Burk**, vice president of sales for Kearney & Trecker Corp., Milwaukee, Wis., since 1943, was recently elected vice president for manufacturing, according to an announcement made by K & T president, Francis J. Trecker. Mr. Burk will also continue as head of the company's sales division. Mr. Trecker also announced the appointment of **Andrew K. Wilson** as director of industrial relations and head of the personnel department.

**Glen A. Wilson** has been appointed general superintendent of the Carbide Division of the Firth Sterling Steel & Carbide Corporation, McKeesport, Pa.



Glen A. Wilson



R. S. Cooper

The Board of Directors of The E. Horton & Son Company, Windsor Locks, Conn., recently announced the election of **R. S. Cooper** as president. **D. B. Huntting**, former president, was elected Chairman of the Board.



**"BUILT-IN" FEATURE**  
*Saves 50%*  
**FLOOR SPACE**

*Hammond*  
**NO-DUST GRINDER**

- Requires only 6 1/2 square feet.
- Protects employees' health — and nearby machine tools from dust and grit.

For 10", 12" and 14" wheels.

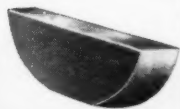
**WRITE FOR CATALOG**

*Hammond Machinery Builders*  
1631 DOUGLAS AVE., KALAMAZOO, MICH.



PRECISION  
ACCURACY

**FLAT  
BOTTOM  
WOODRUFF KEYS**



**STANDARD**

*HORSE NAIL CORP.*

NEW BRIGHTON PA.

# WESTLEN REELS

*Adjustable  
Self Centering*

For feeding strip and wire coil stock to presses. Coil capacity 300 to 500 lbs. Outside ring dia., 28" to 36". Height of reel, 36". Wheel automatically adjusts parts to suit inside diameter of coils from 11" to 30". Arm allows for quick conversion to horizontal or vertical position and adjusts height of reel.

SEND FOR LITERATURE

**The RULETA Co.**  
27 WARREN ST. NEW YORK 7,



**ALL THE DATA YOU NEED...**

**on DRILL JIG BUSHINGS**

*...at the flip of a single page*

Make drill jig designing easier with this "Flip-a-page" catalog.  
**Free on Request**

**COLONIAL BUSHINGS INC.**  
P.O. BOX 37, HARPER STATION  
DETROIT 13, MICHIGAN

George A. Ingalls, a director and comptroller of American Machine and Foundry Company, New York, has been elected a vice president, according to an announcement made by Daniel H. Haynes, vice chairman of AMF's board of directors.

J. Y. Scott, president, and the board of directors of the Morse Twist Drill & Machine Company, New Bedford, Mass., announce the election of C. F. Myers to vice president and sales manager.



C. F. Myers



Ralph M. Johnson

Ralph M. Johnson, vice president in charge of sales, Norton Company, Worcester, Mass., was elected president of the American Supply and Machinery Manufacturers Association at the opening of its recent convention in San Francisco.

Skilsaw, Inc., Chicago, manufacturers of portable power tools, has purchased the controlling interest in Loud-Wendel, Inc., Middleport, New York, Bolton Sullivan, president of Skilsaw, has announced. In the transaction, Skilsaw acquired the stock interest of Glen F. Loud, one of the founders of the Middleport company, which makes circular wood saws, dado sets and industrial knives.

Bolton Sullivan, president of Skilsaw also will head Loud-Wendel, Inc., as president, replacing Loud. Other officers include: George E. Brennan, treasurer, and Kermit Du Moulin, general sales manager.

The appointment of Thomas R. Lawson as assistant sales manager of industrial products for the Westinghouse Electric Corporation was announced recently in Pittsburgh by W. W. Sproul, industrial products sales manager.

## Norton Company lays cornerstone for plant expansion

Carl Ahlstrom, retired 50-year man in Norton Company's Grinding Machine Division, spreads mortar over a copper box containing mementos of the company's 51 years in the grinding machine business during cornerstone laying ceremonies at Worcester, Mass. July 26, 1951.

The new expansion will consist of a 6½-acre single-story factory, 740 by 300 ft. adjoining a 360-ft. by 100-ft. office building. Completion is planned for March 1952.



Assisting Mr. Ahlstrom are (left to right): Frank W. Smith, vice president; Andrew B. Holmstrom, vice president and Mayor of Worcester; and Milton P. Higgins, president. Coming to Norton's in 1890, Mr. Ahlstrom was with the grinding machine end of the business since its formation in 1900. He retired in 1944 within a month of his 54th year with the company.

## E. Horton & Son Company announces Dayton distributor

The E. Horton & Son Company, Windsor Locks, Conn., manufacturers of Horton Chucks, announce the appointment of Flack Equipment Co., 1240 McCook Ave., Dayton, Ohio, as distributor of their chuck line in the Dayton area.

## BARGAINS! LONG DRILLS

9" FLUTE  
12" HIGH SPEED 12"

Size	Price Each
1/8" x 12"	\$2.06
9/64" x 12"	2.06
5/32" x 12"	2.06
11/64" x 12"	2.06
3/16" x 12"	2.06
13/64" x 12"	2.19
7/32" x 12"	2.19
15/64" x 12"	2.40
1/4" x 12"	2.40
17/64" x 12"	2.55
9/32" x 12"	2.55
19/64" x 12"	2.75
5/16" x 12"	2.75
21/64" x 12"	3.11
11/32" x 12"	3.11
23/64" x 12"	3.46
3/8" x 12"	3.46
25/64" x 12"	3.81
13/32" x 12"	3.81
27/64" x 12"	4.17
7/16" x 12"	4.17
29/64" x 12"	4.52
15/32" x 12"	4.52
31/64" x 12"	4.52
1/2" x 12"	4.52

## DIAMONDS BARGAIN PRICES

KNOWN FOR THEIR PRECISION AND DEPENDABILITY.

## SAVE WITH EASTERN

Dress your wheels accurately with long lasting diamonds. Specify holder or nib required. No extra charge.

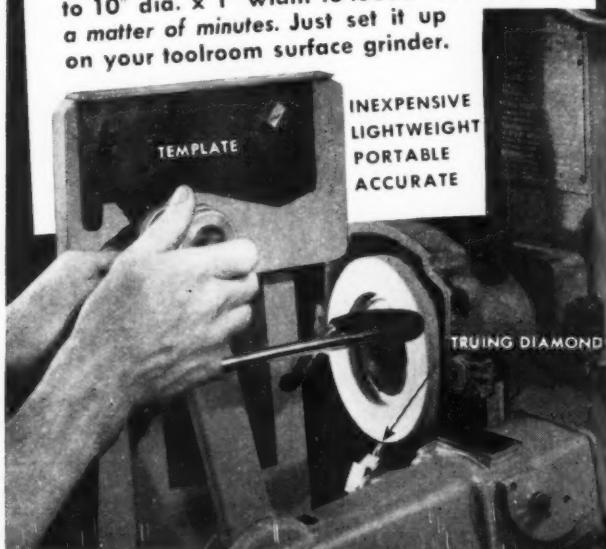
Carat	Price Complete
1/4	\$ 4.50
1/2	7.50
3/4	10.40
1	14.80
1 1/2	19.50
2	24.00
3	29.00
4	52.50

Send for Free Catalog 128 pages

EASTERN

TOOL SUPPLY CO.  
174 Grand St., N. Y., N.Y.

**diaform** Gives you toolroom precision in this fast new method for form-truing the contours of grinding wheels up to 10" dia. x 1" width to .0005" accuracy in a matter of minutes. Just set it up on your toolroom surface grinder.



INEXPENSIVE  
LIGHTWEIGHT  
PORTABLE  
ACCURATE

**WRITE FOR ADDITIONAL INFORMATION.**

Branch Offices: Birmingham  
Boston — Chicago —  
Cincinnati — Cleveland —  
Dallas (The Stance Co.) —  
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Stance Co.) — Los Angeles  
New York — Philadelphia  
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St. Louis — San Francisco —  
Export Dept., West Hartford,  
Conn.

**PRATT & WHITNEY**

DIVISION NILES-BEMENT-POND COMPANY

WEST HARTFORD 1, CONNECTICUT, U.S.A.

*Dedicated to Accuracy for 91 years*



**Engis Equipment Co. receives ECA certificate**

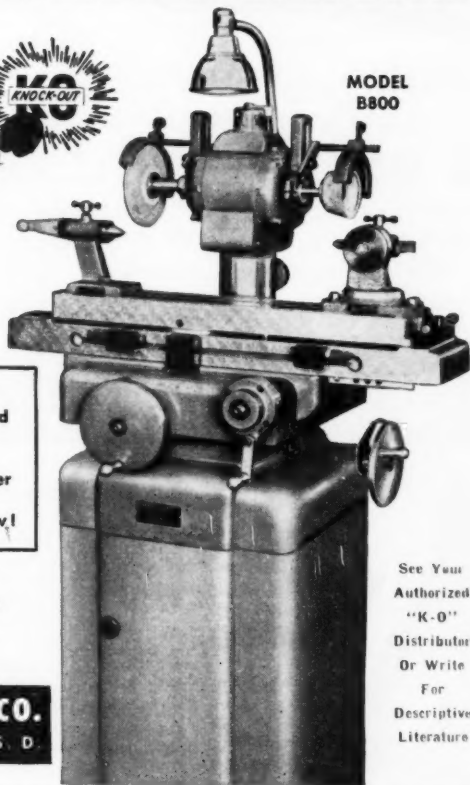
A Certificate of Cooperation of the Economic Cooperation Administration has recently been awarded to Engis Equipment Co., 431 S. Dearborn St., Chicago 5, Ill. The citation reads, in part: "... for furnishing technical assistance to the Peoples of the Marshall Plan Countries to aid them in maintaining individual liberty, free institutions and peace."

This certificate was awarded to Engis Equipment Co. as a token of gratitude for the firm's services in helping visitors from abroad to become better acquainted with American machinery and production methods.

**Lyon-Raymond changes name**

The 111-year old Lyon-Raymond Corporation, manufacturers of electric industrial trucks and hydraulic elevating equipment, will be known as The Raymond Corporation after September

# New! Model B800 Series TOOL and CUTTER GRINDERS



MODEL  
B800

Four  
New Improved  
Models  
of the  
Tool and Cutter  
Grinders  
Available Now!

Distributed  
Only Through  
Franchise  
Dealers

**K. O. LEE CO.**  
ABERDEEN, S. D.

See Your  
Authorized  
"K-O"  
Distributor  
Or Write  
For  
Descriptive  
Literature

1, 1951, George G. Raymond, Sr., president and George G. Raymond, Jr., executive vice president of the Greene, N. Y. firm, have announced.

## Accurate Bushing Co. expands Garwood plant

To meet the increased demand for its products in both the defense program and for regular industrial production, the Accurate Bushing Company has completed an expansion of its plant

and production facilities at Garwood, N. J.

The manufacturing area has been expanded about 33% and the addition of new equipment and improved plant layout has increased production facilities in the neighborhood of 100%. These changes, together with increased sales representation in strategic cities over the U. S., will mean still further improvements in Accurate Bushing Co.'s products, and its service to the machine tool industries.

# UNMATCHED VALUE

for  
QUALITY and SERVICE

*always specify*

## ACE DRILL BUSHINGS

Largest Western Inventory of Standard and  
Special Sizes . . . Highest Quality Steels  
. . . Perfect Design and Engineering . . .  
Priced Right . . . Faster Service

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**ACE DRILL BUSHING CO.**

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**DU DRILL**  
**THE MIRACLE**  
**DRILL . . .**

**WITH THE  
WELDED  
TUNGSTEN-  
CARBIDE TIP**

Drills High  
Speed Steel —  
Other Hard  
Metals and Ce-  
ramics — Gloss  
— Plastic. No  
Metal Too Hard

No drill equals DU-DRILL in performance!  
Positively drills the hardest metals —  
anything between Rockwell C-35 and  
C-84 it finds easy. DU-DRILL cuts, it does  
not anneal, burn or melt.

Write for free information now!

**COFFEY-CUMMINS MFG. CO.**  
16 NORTH MARENGO AVENUE  
PASADENA 1, CALIFORNIA

### Distributor for G-E electrodes

The Machinery and Welder Corpora-  
tion, St. Louis, Mo., has been appointed  
as a distributor for G-E stainless-steel  
arc welding electrodes, it was an-  
nounced recently by General Electric's  
Welding Divisions. Stocks of the elec-  
trodes will be maintained in ware-  
houses in Chicago, Milwaukee, St. Paul,  
Moline, and St. Louis. In addition to  
marketing the equipment, the com-  
pany's offices in these cities offer ap-  
plication assistance to users.

Plug Gages  
Ring Gages  
Adjustable Snap Gages  
Centerless Lapping Machines  
Pneumatic Hammers, (Chipping & Rivet-  
ing) (Auto Body, sheet metal and Fender)  
Hydraulic Jacks (Auto Service and Auto  
body)  
Re-grinding and re-sizing of plug, Ring and  
Adjustable Snap Gages)

**JAS. CLARK**  
139-149 17th Ave., Paterson 3, N. J.





# Hole Location Practices

Published in the interests of greater accuracy and quality in the toolroom and on the production line by the Moore Special Tool Company, Inc., 728 Union Avenue, Bridgeport 7, Conn., builders of Jig Borers, Jig Grinders, Panto-Crush Wheel Dressers, Die Flippers, Motorized Centers and a complete line of Hole Location Accessories.



Take a good look at this precision part. It's magnesium, and has a total of 31 holes—some bored, some tapped, and 2 large ones recessed. There are 20 separate milling cuts. In addition, the base and the bevel on base are turned. All these faces and holes are held to 0.0005". Imagine how many operations it would take, the number of different machines needed, and the time expended in producing 100 of these parts.

**THE COMPLETE JOB WAS DONE ON THE MOORE JIG BORER** in a fraction of the time required by other means. One simple block fixture was used to hold the part around the base for all operations. Using the Moore micro-sine table and parallel set-up blocks, only 11 set-ups were necessary.

The speed, accuracy and simplicity of operation of the Moore Jig Borer are the results of a combination of time-proven features, including hardened, ground and lapped lead screws for precise, rapid table settings within 0.00015"

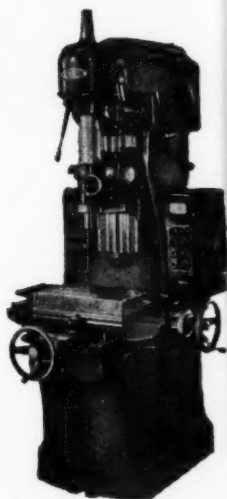
by coordinate location; infinitely variable spindle speeds—push-button controlled—from 75 to 2400 RPM; three power-feed ratios—0.0015", 0.003" and 0.006"—per revolution of spindle in either direction; centralized control panel; disconnect clutch for easy indicating and totally enclosed drive mechanism.

● Write for the new 24-page No. 2 Jig Borer catalog, which contains complete design specifications, describes Jig Borer accessories and gives further examples of Jig Borer jobs—in the toolroom and on the production line.

## Valuable Book for Defense Plant Training

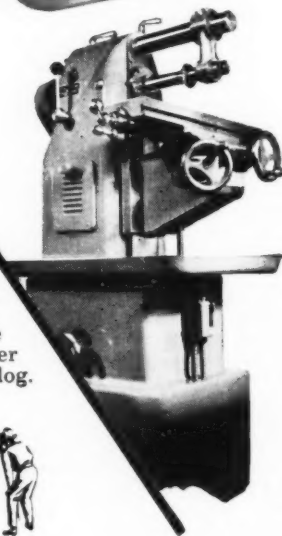
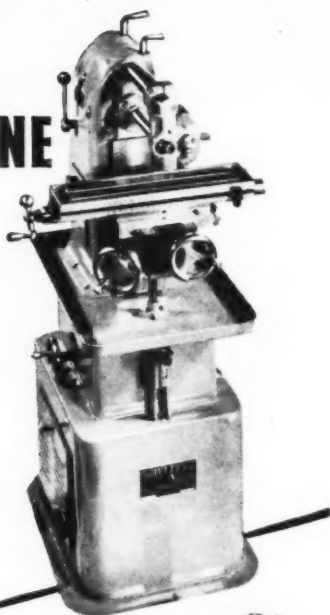
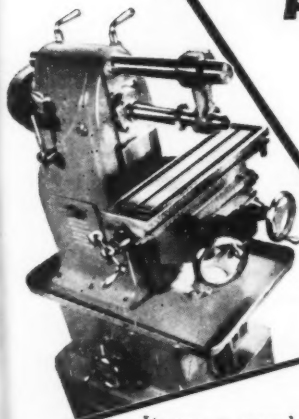


Many examples of jig-boring and jig-grinding practices. 448 pages, 400 illustrations. 184 pages of Woodworth Coordinate Location Tables from 3 to 100 holes. Available at special price of \$3 in U.S.A., \$3.50 elsewhere. Send check or money order to Moore Special Tool Co., Inc., Bridgeport, Conn.



**No. 2 MOORE JIG BORER** Table Working Surface of 10" x 19"; accurate lead screws; infinitely variable spindle speeds, 75 to 2400 RPM; 3 power feed ratios.

# A *Better* MILLING MACHINE From Any Angle...



It was a popular machine tool as the Vernon Milling Machine even before SHELDON completely re-engineered and improved it... added "Precision" Timken Tapered Roller Bearings; added a completely new variable speed type drive, increased the speed range and provided an optional power feed.

Quality-built throughout, in the modern SHELDON plant which was built and specially tooled to make fine precision machine tools, the modern SHELDON Milling Machine is truly "a better milling machine from every angle." Write for Catalog.



## SHELDON

CHICAGO



SHELDON MACHINE CO., Inc., 4242 North Knox Ave., Chicago 41, Ill.

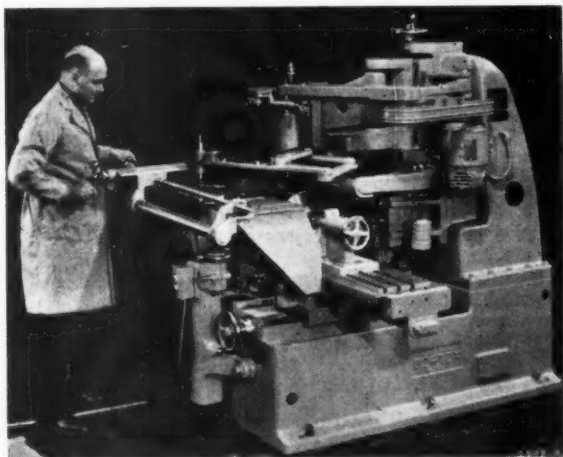
# What's New

## IN METALWORKING

### Gorton Pantographic Roll Engraver mills rolls and cylinders

A completely new Pantograph Machine has just been designed and built by the George Gorton Machine Co., Racine, Wis. It is for accurate milling, routing and engraving completely around cylinders and rolls. One of the basic advantages of this machine in addition to its economy is that modifications of various machine components may be made easily to meet a wide range of requirements as to ratio of reduction, range and roll diameter.

In operation, this Pantographic Roll Engraver accommodates rolls (ferrous or non-ferrous metal and plastic) from 6" to 12" in diameter and up to 40" long. The work piece is held between centers as on a lathe. Movement of the tracer forward and back, automatically rotates the roll. Longitudinal, left-to-right, movement of the tracer does not rotate the roll. Thus, the cutter point is always centered over the axis of the work piece.



**The Gorton Pantographic Roll Engraver . . . mills, routs and engraves completely around rolls and cylinders. It is applicable for work on rolls from  $\frac{3}{4}$ " to 6" in diameter and up to 12" long, as well as rolls of from 12" to 30" in diameter, up to 12 feet long.**

The maximum area covered by the cutter at one setting is 5" by 20". A master pattern is cut in flat brass, sheet iron, zinc or sheet plastic in either sunk or relief form and twice the desired size. Only a small segment or section is required of the entire design if it is to be repeated all around the roll. Then the master is clamped to the master table at front of machine ready for tracing.

During the tracing and cutting operation, the cutter reproduces on the roll the master design one half size and at whatever depth of cut that is required. For heavy roughing cuts, a built-in manually-operated scanning attachment is furnished into which the tracing spindle is clamped. This attachment permits much heavier cuts with positive control in the roughing operation.

Repeating the design segment of the master in order to cover the entire roll surface is accomplished by indexing the work piece, or roll, as each segment is completed. This is done by a simple adjustment of the headstock drum. In this way all milling, routing or engraving is accomplished without removing or otherwise disturbing the work piece.

There are no gears used in this machine to develop backlash or to require adjustment. Correct speed of rotation for reproducing the master completely around rolls of any diameter (within the capacity of the machine) is provided by a built-in compensating mechanism, easily set for each individual roll diameter. This eliminates the need for change gears and permits accurate work on rolls of infinitely varying diameters.

All pantograph and pantograph-controlled linkages and rotating members run on anti-friction bearings to assure maximum sensitivity in operation. Inertia of all vertically moving members of the rotating mechanism is counterbalanced. A calibrated scale is furnished with an adjusting screw regulating roll rotation for rolls of infinitely variable diameters, within the capacity of the machine. To feed cutter spindle down to cutting depth, or to release it, either a toggle switch on the tracer spindle or a foot switch can be furnished.

This machine features a heavy duty spindle, belt-driven by a ½ h.p. variable speed motor, d.c., which provides infinitely variable spindle speeds of from 500 to 12,000 r.p.m. If required, this speed range can be changed to meet specific needs. The roll is held on centers and is rotated automatically during the cutting operation by the headstock drive. The tailstock center floats on anti-friction bearings. The rotating mechanism is an exclusive Gorton development which is completely synchronized with the cross movement of the tracer spindle.

There is ample movement provided for the work table, both longitudinally and transverse, for operating convenience, and the copy or master table is easily swung out of the way from the machine table to permit free loading and unloading of heavy rolls. The manual scanning attachment can be quickly detached from the tracer spindle and master table and swung down below when not required.



## A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in ¼" to 1" diameters. Send for price list.

**HEIMANN MFG. CO.**

332 Lincoln Ave.

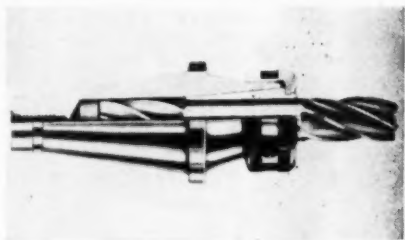
Urbana, Ohio

### Collet chuck features firm grip

B & V Collet Chucks, with extra-powerful gripping power, are introduced by Eric C. Johnson Co., 230 E. Ohio St., Chicago 11, Ill. An exclusive design, found only in B & V Collet Chucks, enables the operator to secure such a firm grip with normal tightening pressure that tools are held absolutely secure and cannot be loosened during work even under such rigorous conditions as deep cuts on tough alloy steels. The collet, however, loosens simultaneously with the locking nut, and milling cutters can, therefore, be changed quickly without loss of time or special effort. Another feature is the smaller external dimension of the locking nut which gives greater accessibility to the work and maximum visibility.

B & V Collet Chucks are designed with an exclusive rubber cushion set into an upper recess in the chuck body which prevents damage to double-end milling cutters and all long tools. The part of the collet inside the chuck body

is exceptionally long for better guidance; for greater rigidity, the projecting end is extremely short. Each chuck is given a series of exacting tests before shipment and a permanent record kept of results to insure precision milling operations.



B & V Collet Chucks are of Swedish design and manufacture, and only the finest materials are used. Due to their design and working advantages, they have received rapid acceptance in the United States and abroad. They are available from stock in sizes from  $\frac{1}{8}$ " to  $1\frac{1}{2}$ ".

*Acme Offers Complete Facilities for All Types of*

## PRECISION GRINDING

**FAST SERVICE...EXPERT WORKMANSHIP...LOW COST**

- INTERNAL
- EXTERNAL
- CRUSH FORM
- CENTERLESS
- TWIN DISC
- SURFACE
- THREAD



Acme is equipped to handle all types of precision grinding. Expert craftsmen, using newest methods and modern equipment, will do the job for you faster, better, more economically. Acme also offers a flat lapping service that can finish surfaces to within millionths. Write for details.

### Acme Industrial Company

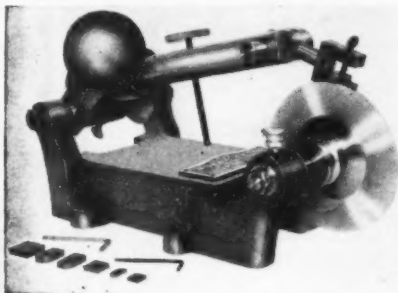
Makers of Standardized Jig & Fixture Bushings  
210 N. LAFLIN ST., CHICAGO 7, ILL.

**THE SERVICE SHOP TO INDUSTRY FOR MORE THAN 25 YEARS**

# Carbide Users

**CAN NOW RESTORE BROKEN TOOLS AND CUTTERS QUICKLY AND INEXPENSIVELY WITH THE NEW IMPROVED MODEL NO. 300.**

## UNION CUT-OFF MACHINE



### WHAT IT DOES:

- Cuts broken sections off damaged carbide tools without grinding.
- Cuts standard carbide blanks to any desired size.
- Saves time-consuming grinding on carbide tools.
- Saves carbide tools that otherwise would be scrapped.
- Saves you money on costly diamond grinding wheels.
- Saves you money by making possible the purchase of large-size standard carbide blanks.
- Simple to operate and automatic in operation.

### SPECIFICATIONS:

1/4 H.P. motor, 1725 R.P.M. 110 Volt. Overall size 7" x 12" x 8" high. Supplied complete with diamond cut-off blade and motor for \$275.00 F.O.B. Stamford, Connecticut

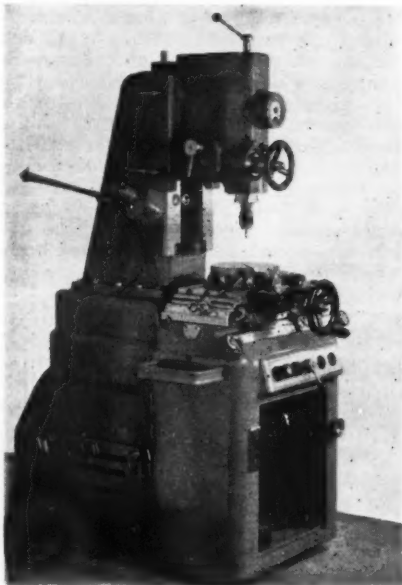
LITERATURE ON REQUEST

**UNION**  
**WIRE DIE CORP.**

71 W. 45TH ST., NEW YORK 19, N. Y.  
PLANT: STAMFORD, CONNECTICUT

## Schroeder precision jig borer

The Schroeder Jig Borer is now being offered in the United States by Ernest Gottschalk Co., Inc., 401 Broadway, New York 13, N.Y. This machine is stated to combine great precision with rugged construction. By means of end measures, an accuracy of .000039" is obtainable, but graduations on the hand wheels permit readings of .00039" even for the rough setup.



The table size is 21.6"x11.6", and the actual working surface is 20"x10". The spindle has two feeds, which can be operated either by hand, or automatically. All gears in the spindle housing run in oil. The transmission is housed in the machine base and is mounted on vibration-proof dampers. The machine is driven by a 1 1/2 h.p. motor directly coupled to the transmission. The hydraulic transmission, which is infinitely variable between 0 and 2000 r.p.m., is suitable for both clockwise and counterclockwise rotation.

The machine is also equipped with a rotary table fitted with optical graduations and reading to an accuracy of 1.5'.



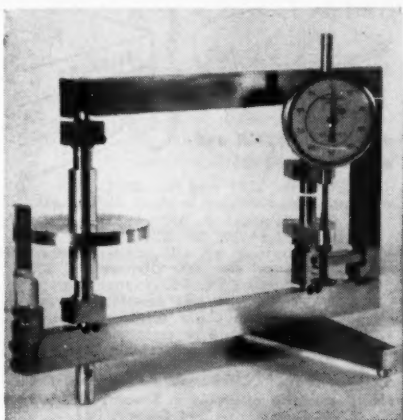
The working tolerance on the rotary table is 10 seconds. The rotary table has a diameter of 10", and can be rotated 360°. A universal facing and boring head is also provided with each machine. The rotary table can also be supplied as a separate unit for use on milling machines, etc.

**Portable calibrator has direct reading to .000002"**

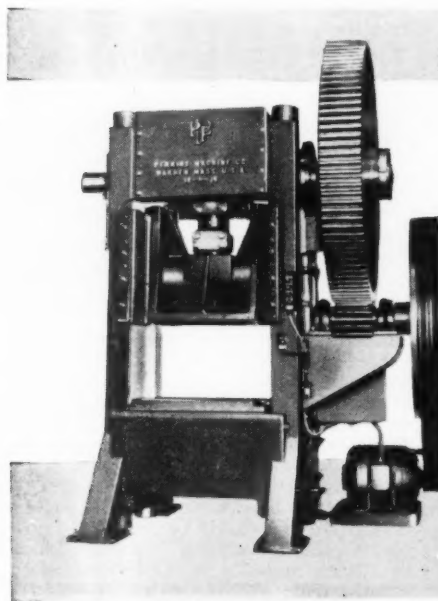
A useful instrument for calibrating and checking such measuring devices as extensometers, strain gages, dial gages and test indicators, is the Model CSI-Templin Calibrator, recently introduced by Custom Scientific Instruments, Inc., P. O. Box 170, Arlington, N. J. This accurate, portable instrument provides direct reading to two millionths (.000002") of an inch. The total range of measurement is .040". It calibrates instruments with gage lengths of from 0.1" up to 10".

When checking extensometers, a feature of the Calibrator is the removable gage posts. This permits using gage posts which are made of the same ma-

terial (steel, aluminum, brass, plastic, etc.) to which the extensometer will be applied in use. This arrangement permits checking the behavior of the ex-



tensometer as used under service conditions, by including effects of friction at points of contact with the specimen



*Announcing!*

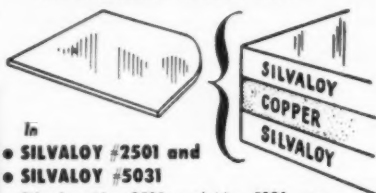
**THE NEW PERKINS  
Model 12-H-36  
Straight Side • Single Crank  
Tie Rod PRESS**

This new Perkins Straight Side, Single Crank Power Press is of sturdy construction . . . built to give years of dependable service and to meet today's unusual production requirements. Can be made in various heights and strokes. Capacity 200 tons. Diameter of main bearing 8". Bed area 36"x36". Write for details.

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*Press builders for 50 years.  
Presses built to special specifications.*

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- In  
 • **SILVALOY #2501 and**  
 • **SILVALOY #5031**

Silvaloy No. 2501 and No. 5031 are clad materials furnished in three thicknesses:

.020 thick consists of .010 copper center-

clad both sides with .005 Silvaloy No. 2501

.011 thick consists of .005 copper center-

clad both sides with .003 Silvaloy No. 503

.016 thick consists of .008 copper center-

clad both sides with .004 Silvaloy No. 503

Each of the alloys are furnished with or without radius, square or rectangular, Pentagon shape 80 degree with radius, Pentagon shape 60 degree no radius, triangle, circles, etc. Available in all standard tool sizes.

Shims are also available in Silvaloy No. 503, No. 2501, Constantine and Copper.

### STEEL SALES CORPORATION

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Spindle  
Extension  
Assemblies

Morse Taper  
Adapters with  
and without Set  
Screw Slots

Shur-Lock  
Micro Nuts

Consult SEIBERT engineers before retooling or replacing parts on multiple spindle machines.



**Seibert & Sons, Inc.**  
 E. Peoria 8, Ill.

and any variations in behavior of the extensometer due to clamping force or design of the clamp. Removable gage posts permit easy and inexpensive reconditioning of their surfaces where instrument points or knife edges cause marring, or in extreme cases, replacement by new posts.

The CSI-Templin Calibrator is available in two models: Model CS-28A, made from aluminum, for use where controlled temperature is available or where the ultimate in accuracy is not required; Model CS-28B, made from Invar for use where temperatures may vary and the ultimate in accuracy is required.

### Wear and abrasion-resistant centers

Wear and abrasion-resistant centers, said to outlast high speed and other alloy centers three to ten times before re-dressing becomes necessary, are now available from Gorham Tool Company, 14400 Woodrow Wilson Ave., Detroit 3, Mich.

"M-40-U," a wear and abrasion-resistant material developed by Gorham, forms a core that is induction brazed into the steel shank of the center, after which the entire center is finish ground.

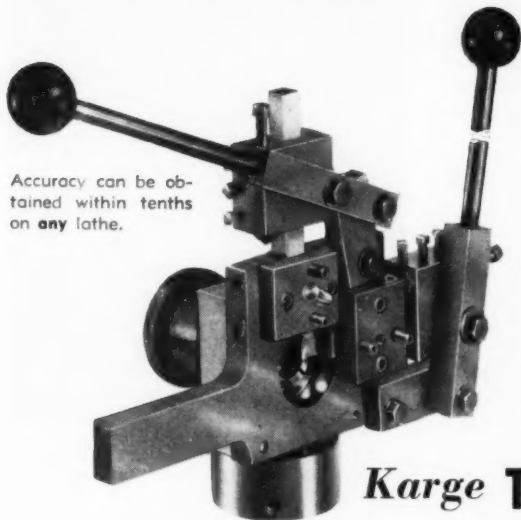


Thus, the wear material is always supported by the tough shank steel throughout the life of the center. These centers require only a clean-up grind when wear finally occurs, and hundreds of clean-up grinds can be made without loss of wear-resistant properties, since the "M-40-U" alloy is actually a deep core, rather than a clad or applied tip.

Gorham "M-40-U" centers and half-centers are available with Morse, Jarno or Brown and Sharpe taper shanks, in lengths from 3 3/4" through 12 3/4".

# How to Lick Two Pressing Problems

Accuracy can be obtained within tenths on **any** lathe.



## Problem 1:

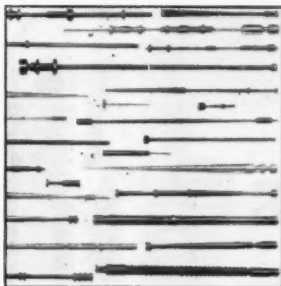
How to turn long, slender, intricate parts economically, with no special tooling or set-up costs.

## Problem 2:

How to get precision parts from your non-precision or obsolescent equipment.

**ANSWER: Use a**

**Karge TURNOMAT  
LATHE ATTACHMENT**



These are high-precision accessories, made in 4 sizes, that mount on the tool post, cross slide or turret of **any** lathe or semi-automatic screw machine. By their use, it is possible to turn from 1/16 to 1-3/4" bar stock to any length and to an infinite number of diameters, shapes or forms. They turn straight work or tapers to extreme slenderness, with fine finish and tolerances within tenths. There is no special tooling or set-up expense.

You can use them to get your old equipment into precision production, for precision is incorporated in the Turnomats live follow steady rest. The lathe or screw machine head stock is used only as a means to rotate stock.

Think what this means in terms of getting your old equipment into current precision production, with the delivery of **new** machines what it is at the present time!

Many large shops are finding Turnomats the answer to **today's** problems. They can be the answer to **yours!**

The type of work the Turnomat does best. Stems, shafts, tapers, spindles, broaches, screws. All have fine finish, and close tolerances.

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## TURNOMAT COMPANY, INC.

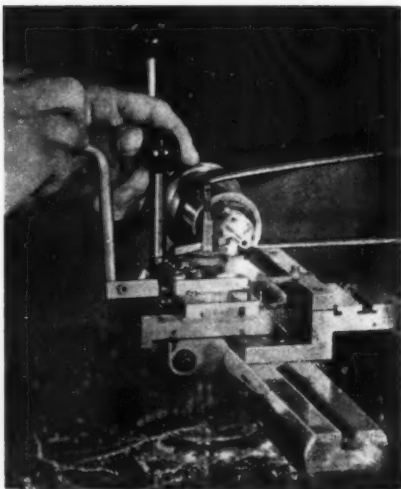
BRIDGEPORT, N. Y.

### Precision jeweler's lathe

Louis Levin & Son, Inc., 782 E. Pico Blvd., Los Angeles 21, Calif., have introduced their precision Jeweler's Lathe to industrial firms. Modern plants are finding the Levin precision jeweler's lathe and its many useful attachments to be the answer for numerous production and second operation problems.

An example of firms making use of this modern equipment is the R. A. Hawks Manufacturing Co., Sierra Madre, Calif. This firm has increased production 50% in the machining operations of a precision exhalation valve for high altitude oxygen masks. After being blanked on an automatic screw machine the pieces are recessed and turned to the required form on the jeweler's lathe. The complicated shape is produced by a cam controlled cross slide. The above illustration shows a Levin Jeweler's Lathe profiling the stem of an oxygen regulator valve.

Formerly these operations were done on a heavy bench type lathe. The work



which used to require the services of an experienced machinist is now handled efficiently by a woman operator at twice the former speed.

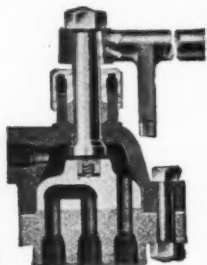
## Nicholson Control Valves **SET RECORDS for LONG LIFE**

In a wide range of plants—steel, metal working, processing, etc. — Nicholson cylinder control valves have now been in constant use for over 25 years. Their capacity for longer leak-free service is confirmed by many installation records which show Nicholson valves actually become tighter with use. This is because their flat discs tend to lap themselves on the seats.

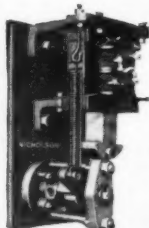
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Nicholson stand-ard and special valves in lever, foot, solenoid, motor types; for air, gas, oil, steam, water; size 1/4" to 2 1/2"; press. to 5000 lbs. CATALOG 1250.



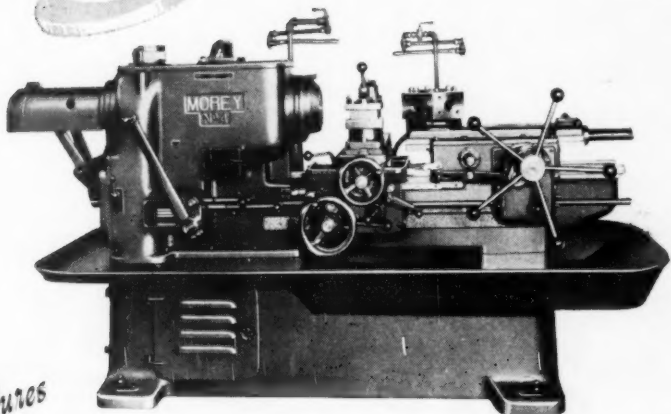


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## TURRET LATHES

No. 2 Plain Type

Nos. 3, 4 and 5 Universal Type



### Features

Infinite variable vibrationless spindle speeds.

Remote speed selection control for speed and ease of operation.

The newly designed MOREY TURRET LATHES take advantage of tungsten carbide tools and incorporate all technical improvements in metals, electronics and hydraulics...our design is not hampered by tradition.

Size	Bar Capacity	Swing	Motor
No. 2 Plain.....	1" x 6"	14"	3 HP
No. 3 Universal....	1 1/2" x 10"	14 1/2"	5 HP
No. 4 Universal....	2" x 12"	19 1/2"	7 1/2 HP
No. 5 Universal....	2 1/2" x 14"	21 1/4"	15 HP

#### FOR BAR and CHUCKING WORK

OBTAIN MAXIMUM PRODUCTION WITH MINIMUM EFFORT FROM MOREY TURRET LATHES . . . INVESTIGATE!



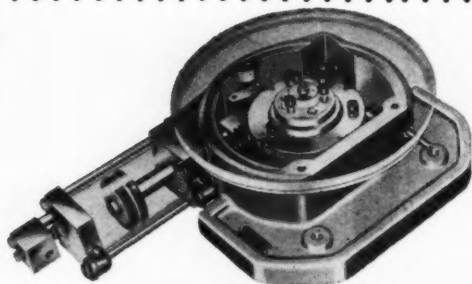
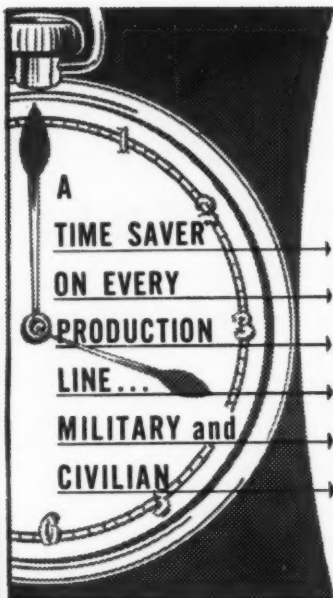
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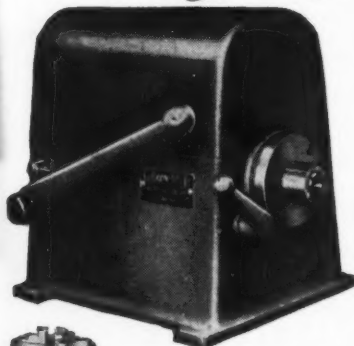
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A recent addition to the COLBORNE line of Speed Lathes is the Series 30 machine. This speed lathe is indispensable for economical polishing, grinding, burning and lapping.

Very compactly constructed to do highest quality work with the COLBORNE features of spindle bearings running in oil, instant stopping brake, easy opening collet and standard speeds of 600-920-1720-3280-4800 RPM using 3/4 H.P. motor and cone pulleys. Collets and chuck may be used.

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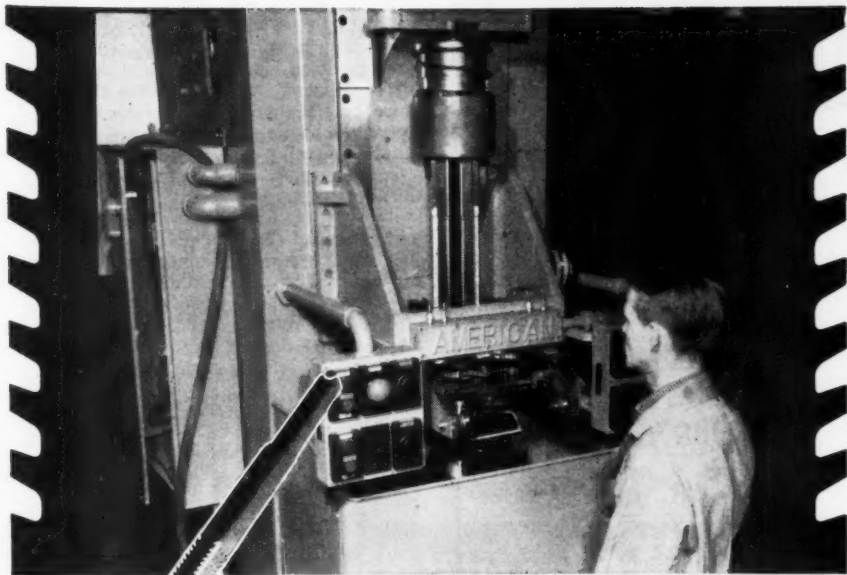
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A special, large, American-engineered, automatic, six station pull head, on a standard American VP 3-10-30 Vertical broaching machine, helps to speed production on this automatic transmission part. A total of twelve angular sides, plus twenty-four corner radii are finish broached on 150 of these steel forged parts per hour. The machine is equipped with an American-engineered fixture with a manually operated work slide interlocked with the machine cycle for maximum safety.

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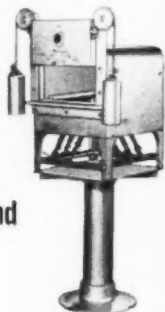
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## THE JOHNSON 706 HARDENING, TEMPERING and ANNEALING FURNACE



Select any temperature you require from 300° to 1875° F. Get clean, uniform heat at low cost. The Johnson 706 is easily regulated. Six direct jet bunsen burners have separate valves and pilot lights. Firebox 7 x 13 x 16½ lined with high temperature refractory. Counterbalanced door opens upwards.

No. 706 Pedestal (illustrated)	-----	\$278.00
No. 706 Bench	-----	\$250.00
No. 654 with 5 x 7¾ x 13½ firebox:		
Pedestal	-----	\$150.00
Bench	-----	\$124.00

All Prices F.O.B. Factory. Order Now!

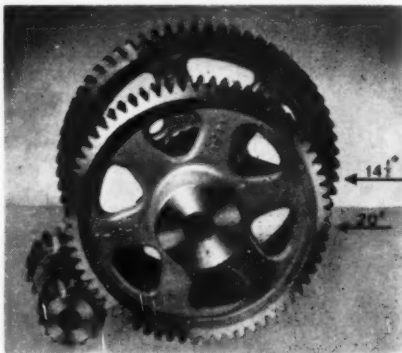
JOHNSON GAS APPLIANCE CO.  
570 E AVE. N.W., CEDAR RAPIDS, IA.

**JOHNSON**  
FURNACES FOR INDUSTRY

## Gears have 20° pressure angle

Boston Gear Works, 81 Hayward St., Quincy 71, Mass., has announced standardized, stock Spur Gears and Steel Miter Gears cut with a 20° pressure angle instead of the usual 14½° pressure angle. The increased pressure angle permits a wider tooth base, a stronger tooth, longer contact surface, larger tooth bearing surface and smoother rolling action. Undercut is minimized. The result is increased horsepower per dollar—an average saving of 20% per horsepower delivered, as compared with 14½° gears.

The 20° Boston Gears of finer pitch may be used for equal work, with a



resulting space saving of approximately 20%, as the picture demonstrates. Gear weight is similarly reduced, the average increase in horse power per pound of gear weight being likewise on the order of 20% for the 20° angle gears.

Use of gears of finer pitch for equivalent service also results in a saving in initial cost of around 20%. In addition to these savings, the 20° Pressure Angle Gears run smoother and quieter than the 14½° gears for the same service.

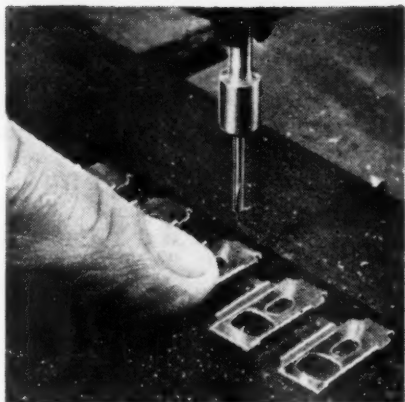
## W-S reamers have .0002" tolerances

A new line of small tools produced by Woodruff & Stokes Co., Inc., 349 Lincoln St., Hingham, Mass., combining new design and manufacturing methods, have tolerances held to .0002" to —.0000" or closer.

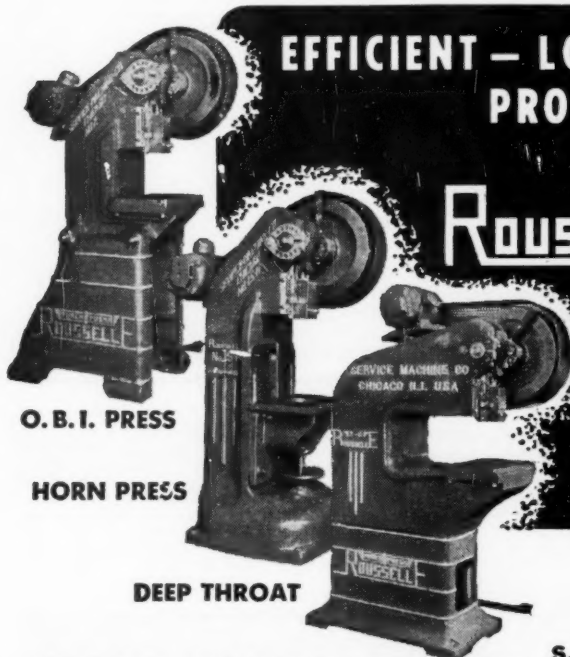
W-S Reamers are carefully ground and honed to give sharp cutting edges and to minimize sticking of the metal to the cutting edge. They are made of carbon steel and are heat-treated by special methods that assure a hard surface and a tough, resilient core. The reamers are also available in high speed steel or special alloys. Tool sizes are from .0005" to 1/4" in diameter.

Three types of reamers are supplied, flat, half-round and fluted (spiral or straight). Any of these types are ground to give a taper, two or more steps, or a combination of taper and steps to meet job requirements. All W-S Reamers are made on order to job specifications.

An instrument company was able to replace two tools with a W-S Reamer-Countersink. Average run of 25,000



was two to three times the performance previously obtained. Quality was substantially improved.



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ALSO REPAIRING OF CARBIDE TOOLS. MAKE USE OF OUR EFFICIENT TOOL SHARPENING SERVICE. SPECIAL GANGS OF CUTTERS CONVERTED QUICKLY AND ECONOMICALLY TO YOUR BLUEPRINTS FROM OUR LARGE STOCK OF STANDARD CUTTING TOOLS.

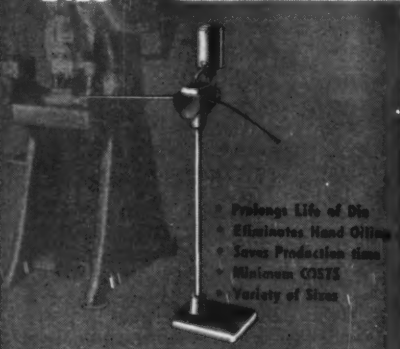
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We are glad to demonstrate the quality of work that can be turned out. Send us samples of your parts and you'll be impressed with what you can do and how little it will cost you. Sizes and types available for iron or cold rolled steel rivets up to  $\frac{3}{4}$ " with capacity for larger rivets of softer materials.

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### REAMERS IN Decimal SIZES

From .032 .033 .034 .035 all the way up-blanks can be ground to your exacting specifications, delivered in approximately 10 days. By purchasing SUPEREAM REAMERS in steps of .001 you save Time, Labor and Money in the cost of extra machining and lapping. SUPEREAM REAMERS all have ground and polished flutes and are held within .0002 tolerance.

REAMERS are also furnished in Right-hand spiral, right hand cut, as well as Left-hand Spiral, Right-hand cut.

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October, 1951

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**AT NO COST!***



**DIXON**  
*Natural Graphite*  
**MAKES  
BIG DIFFERENCE  
IN LATHE CENTER LUBE!**

• You know what a problem it is to stop wear, scorching, burning and breakdown at lathe centers. White lead and ordinary grease are a help . . . but that's all.

It takes Dixon Graphite Lathe Center Lube to really lick this problem. That's because this lube combines Dixon *Natural Graphite* and an extreme-pressure lubricating compound to provide *great film strength*. One user writes, "Your lubricant has eliminated burning entirely and we are enabled to use centers almost indefinitely, and run at greater speeds without undue heating."



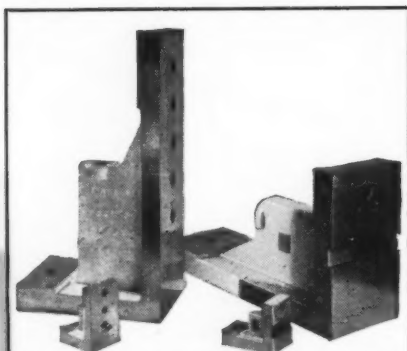
But you convince yourself. We'll gladly send you a handy tube **ABSOLUTELY FREE**. Try it . . . and we're sure you'll be delighted with the results.

**ALL YOU NEED DO** is write to us (letter or post card), requesting free sample. Just give your name and position, and your company's name and address. Joseph Dixon Crucible Company, Jersey City 3, N. J.

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**LATHE CENTER LUBE**

Sold through Distributors





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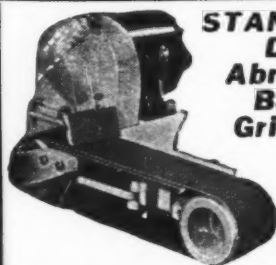
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This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood fibre . . . at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood 4x36 1/4" band. The ideal portable unit.

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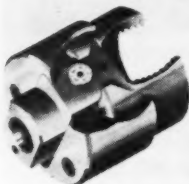
333 Nassau Avenue, Brooklyn 22, N. Y.

### **Boring chuck offers fast set-up**

The Samson Offset Boring Chuck is now being manufactured by Last Word Sales Co., 18500 Mt. Elliott Ave., Detroit 34, Mich. This head is claimed to offer unusual features. The block operates in dovetail ways and the block, cover and body, all of which are machined from the solid and ground, are also lapped on contact areas for rigid fit of the block and precision setting. Fast and accurate setting of the tool hole at dead center is accomplished through provision of a positive stop against which the tool block is retracted.

The micrometer offset screw offers adjustment to .001" and is also hardened, ground and lapped. The hex wrench set-up is smooth and is made convenient by clearly indicated markings on screw and body.

The tool hole in the block (standard sizes 1/2" to 1 1/4") is ground and two set screws hold the tool with positive rigidity. The chuck is available with either threaded body or integral taper shank. When installed in a milling or boring machine, the Samson Offset Boring Chuck provides a tool holding device for cutting tool, set-up bar, etc., as accurate and rigid as the machine spindle itself. Round contour and turned edges contribute to safe and fast handling by the operator.



A complete line of interchangeable Boring Chuck Accessories are available. All are of alloy steel, hardened and drawn, and ground to .0005" slip fit in the tool blocks.



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REFRIGERATION AND VARIOUS INDUSTRIAL APPLICATIONS**

**THE ONLY 100% MERCURY  
SWITCH EQUIPPED CONTROLS**



The distinguishing feature of Mercoid Controls is the exclusive use of Mercoid hermetically sealed mercury switches. These switches are not subject to dust, dirt or corrosion, thereby assuring better performance and longer control life. The items shown below are but a few miscellaneous items. See Catalog No. 700 for the complete line.



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Low Voltage Thermostats



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Liquid Level Control



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If you have a control problem involving the automatic control of pressure, temperature, liquid level, mechanical operations, etc., it will pay you to consult Mercoid's engineering staff—always at your service.

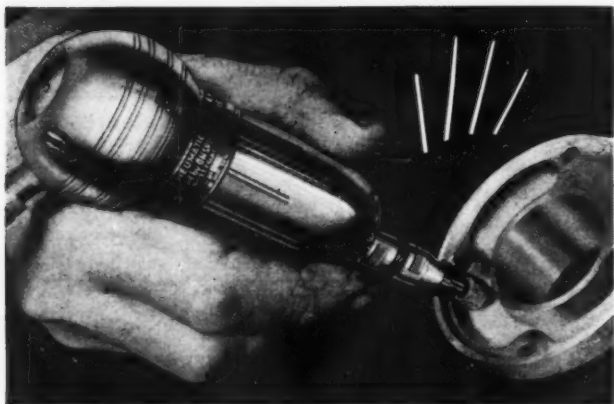
Write for Mercoid Catalog No. 700  
It contains a lot of control information.

THE MERCOID CORPORATION - 4223 BELMONT AVE. CHICAGO 41 - ILL.

## Day unit dust controller

The Day Company, 810 Third Ave., N.E., Minneapolis 13, Minn., has recently introduced a unit dust controller, designed to operate independently, while providing maximum dust recovery over a wide range of volume. These units are stated to be especially practical in plants where central dust control systems are not feasible. They will also solve dust problems which are located too far from a plant's central dust control system.

These Day Unit Dust Controllers incorporate the Day Dual-Clone Dust Separator and the Day Exhauster in one self-contained dust control unit. The effective air-dust separation which takes place consists of a two-stage action which utilizes internal skimmers. The dust-laden air enters at the side of the unit and spirals downward to the cone outlet. As the cleaned air spirals up through the internal skimmer stack, most fine dust particles, carried upward with the outgoing air, are concentrated



## THIS *Whirlwind* IN YOUR HAND speeds grinding and deburring jobs!



Compressed air . . . and Onsrud's famous Air Turbine Grinders . . . give you an unbeatable combination for speedier grinding in the tool and die shop or on the production line.

Can be mounted on lathe for center or finish grinding. D1-S Hole Grinder supplied for mounting on jig borer, milling machine or drill press for precision hole grinding.

Light in weight. Always cool in operation. Free from vibration, yet packed with power. Write for Bulletin 1129.

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CONTOUR MILLING MACHINES  
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3908 Palmer Street • Chicago 47, Illinois

by the tapered stack. Here they are skimmed off and returned to the dust outlet.

The continuous air travel from inlet to outlet eliminates power-consuming eddy currents and back pressures caused by changes in air flow direction. The unit operates a 6" external static pressure, and the fan can be discharged at any 45° interval, the company reports. Units are available in four sizes, from 500 to 2000 c.f.m., and can be furnished with or without secondary filters.

### PIPE QUIZ

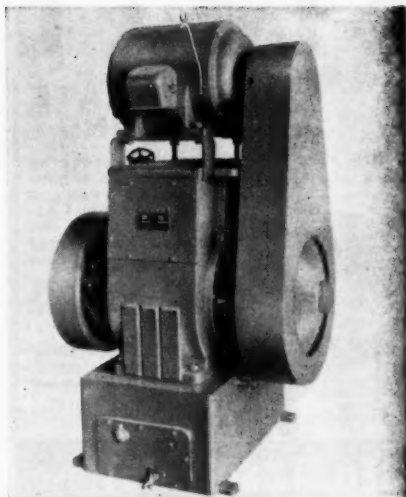
Answers to quiz on page 242

1. 45 degrees
2. Not in mid center
3. High
4. Remove condensation
5. Controls direction of flow
6. Curved
7. Concave
8. 250 pounds
9. Frayed end of rope
10. Without outlets

### Pump for high-vacuum processing

A new Microvac Pump, the Model 812-F, has been put on the market by the F. J. Stokes Machine Co., Philadelphia 20, Pa. The largest Stokes pump yet produced, this new self-contained pump has a capacity of 500 c.f.m. and is suitable for any type of vacuum processing work. It is a water-cooled unit which operates at 390 r.p.m., with a top-mounted 25 h.p. motor; the net weight is 2400 pounds, height is 76", and it occupies a 36" by 38" floor space.

The pump operates at a high volumetric efficiency, due to the complete discharge of air at each stroke, with no chance for re-expansion. With only four moving parts and low relative surface motion of piston to housing, minimum wear and low up-keep can be expected. These high-vacuum pumps discharge slugs of liquid without injury to the pump. The oil reservoir is located in the pump base, where lubricating oil settles when the pump is shut down and vacuum is broken; there is



no danger of flooding the pump cylinder. Oil flows automatically to all parts when the pump is started again.



#### ● SOCKET SCREW PRODUCTS

#### ● CAP and SET SCREWS

#### ● NUTS • TAPER PINS • STUDS

Chicago "Safety Plus" products are designed to give you a tighter, lower cost fastening for any heavy duty purpose. To speed delivery time, call the INDUSTRIAL SUPPLY DISTRIBUTOR nearest you today. Ask for Chicago and get "Safety Plus."

**THE CHICAGO SCREW COMPANY**

2507 WASHINGTON BLVD. • BELLWOOD, ILL.

# CLEAR

## NAMEPLATE MARKING

MODEL  
No. 4



The nameplate on your product is your signature; keeps it neat and legible! Accurate location and alignment are assured

with this  
**NAMEPLATE  
DETAIL PRESS**

- Simple Operation
- Perfect Alignment
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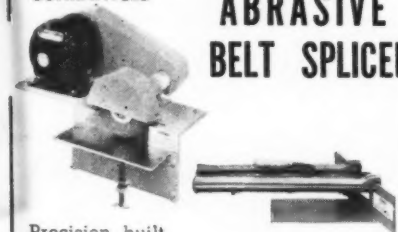
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CHICAGO - 13 - ILLINOIS

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Precision built.

Will splice any size and any kind of abrasive belts, and sleeves, in two minutes, straight and true. Save money and time. Write for particulars, stating the belt and sleeve sizes you use.

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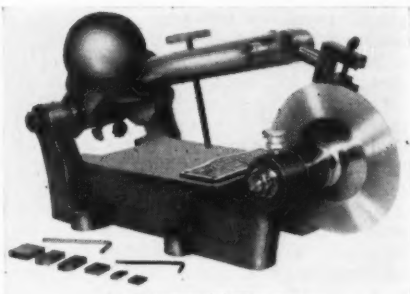
OF

BELLEVUE, MICHIGAN

Dealers Wanted

## Improved carbide cut-off machine

An improved cut-off machine for carbides has recently been introduced by Union Wire Die Corp., 71 W. 45th St., New York 19, N. Y. The operating principle of this unit is the rotation at high speed of a diamond impregnated saw blade (see illustration) to which

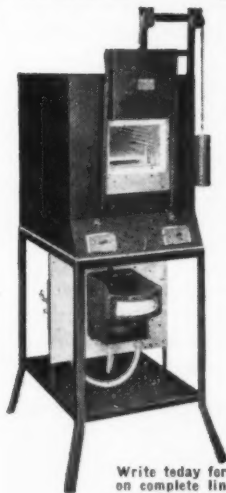


the carbide work is fed by constant pressure. An adjustable arm and clamp provide universal movement, so that pieces can be cut off in a variety of shapes, and with cutting angles already provided as required by the user. The cutting action is by gravity, the same as prescribed by manufacturers of diamond blades for cutting carbides.

The Union Model 300 requires no training to operate and no attention from an operator while running. After a simple initial set-up, the machine slices through carbide while the operator is usefully engaged elsewhere. Upon completion of the cutting, a fool-proof stop halts the cutting operation and eliminates wheel breakage.

The machine will put into use broken carbide tools which normally would be scrapped because of damaged sections from standard shapes without waste, thereby eliminating the need for large stocks of rarely used sizes of carbide. The machine can effect great economies by cutting, rather than grinding away, good carbide, and by saving diamond and silicon wheels used in the grinding process. The Union Model 300 is supplied with a 1/4 h.p. motor, 1725 r.p.m., 110 volts, and a diamond cut-off blade. The overall size is 7"x12"x8". Net weight is 25 lbs.

## PRODUCTION RUGGEDNESS! LABORATORY ACCURACY!



Consistent temperature-controlled heat output of this heavy-duty electric furnace has found wide acceptance in the tool and die industry. Laboratories too have found trouble-free operation and close temperature control a great asset to their closely budgeted operations. This dependable furnace features — special alloy elements, fully enclosed contacts, snug fitting counterbalanced sliding door, °F or °C. Pyrome-

Complete with automatic temperature control .....

**\$490.00**

### OTHER HEAVY-DUTY MODELS

Mod. No.	Inside Dimensions	Max. Temp.	KW	Price
869 FM	8"x6"x9"	2200°F.	4	\$530.00
12 FM	8"x8"x12"	2000°F.	6	\$570.00
12A FM	8"x8"x18"	2000°F.	9	\$650.00

Write today for literature on complete line of Huppert furnaces and ovens in floor and table models.

**K. H. HUPPERT COMPANY** 6845 Cottage Gr. Av.  
Chicago 37, Illinois

MANUFACTURERS OF ELECTRIC FURNACES AND OVENS

## Set-up kit aids spring manufacturers

Lundahl Corporation, 1425 Park St., Hartford 6, Conn., announces a set-up kit with which the spring manufacturer can save time and money in preparing spring-making machines for production. The kit is stated to be the result of years of experience in developing spring-making tools and it is offered to meet a definite demand from Spring Makers.

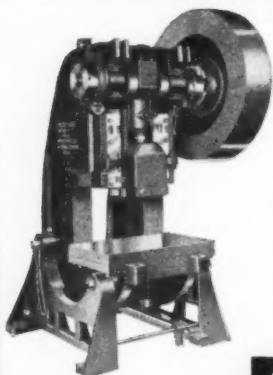
The kit consists of a mahogany cabinet containing a tray with a complete standard set of carbide tools in regular graduations. These tools cover the complete standard size range of the spring-making machine for which it is designed. Tools for oversize diameters can be furnished on request. The operator can set up his machine without lost time looking for the correct size arbor, coiling point, or other carbide tools for his machine.

Within the cabinet is an efficient high-speed grinder fitted with a 4½" diamond wheel and also a 4½" silicon



carbide grinding wheel of proper grades. With this grinder, the operator can touch up the tools with which he is working or make intermediate size tools not formed by the standard sizes in the tray.

# YES . . . WE CAN FURNISH AN AIR FRICTION CLUTCH



7 Models—5 to  
85 Tons Capacity

WITH OUR

**PRESS-RITE**

**85-TON  
POWER PRESS**

The Press-Rite No. 85 is available with either the popular 4-Point Key Clutch or an Air Friction type Clutch. And you have your choice of the flywheel or back-geared models.

Get full details on the entire Press-Rite Line, TODAY!

Write for Bulletin P-650

*Sales Service Machine Tool Co.*



2357 UNIVERSITY AVENUE  
ST. PAUL 4, MINNESOTA

## STOP DUSTS INSTANTLY

*with*

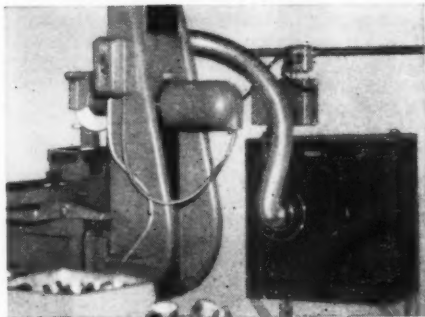
### DUSTKOP

Available from stock of 22  
standard models

300 cfm to 10,000 cfm

**for:** Surface Grinders, Tool and Cutter Grinders; Polishers and Buffers; Abrasive Belts and Discs; Woodworking and Plastic Industry Equipment . . . DUSTKOPS collect almost all kinds of industrial dusts.

Ask for Catalog 605-2. Describe dust problem for recommendation by return mail—no obligation.

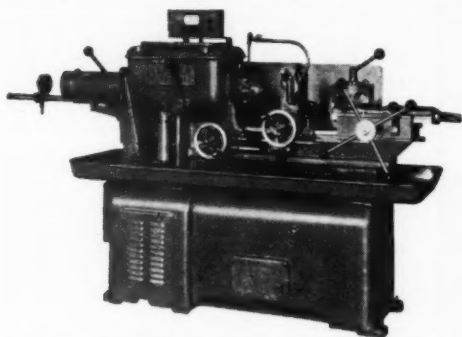


**AGET-DETROIT CO.**

205 Main St.

Ann Arbor, Michigan





## HERE IT IS!

The new Simmons No. 2 Turret Lathe, offered to you with three distinct advantages:

- Low Cost
- High Precision
- Early Delivery

1 1/4" bar capacity . . . 14" swing over ways. Micro-Speed Drive offers infinite speeds—plain, 375 to 1500 RPM; back-gear, 44 to 750 RPM—*for bar or chucking work.* Power feed to turret.

**Plain or Back-Geared**—Forged steel spindle with anti-friction precision bearings, friction clutch and brake. Spindle nose, 2 3/8"-8.

*Write today for complete details.*

### SIMMONS MACHINE TOOL CORP.

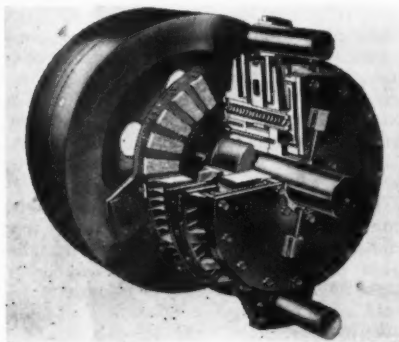
1725 North Broadway, Albany 1, N. Y.

New York Offices: 50 East 42nd Street

Each tool is plainly marked which makes selection easy. Also, each cavity within the cabinet is also marked, assuring accurate control of the tools.

#### Bliss air friction clutch

A new air friction clutch, designed for 24-hour operation at high speed, has been introduced by E. W. Bliss Co., Canton, Ohio.



The new clutch has been designed for fast action. Positive clutch and brake engagement is achieved through an arrangement of driving discs in which movement between full engagement and braking is only a fraction of an inch.

Adequate self-induced ventilation assures rapid heat dissipation. The friction plates themselves are arranged to assist centrifugal blower action, blowing a strong current of cooling air directly on the surfaces where the heat is generated. Cycle-welding of linings to plates encourages rapid heat transfer.

The clutch plates are arranged to compensate for wear automatically. Difference in plate travel with new friction plates and travel with worn out plates is less than a half-inch. Engagement is instantaneous in either case. Clutch and brake friction discs "float" quietly in their mountings and align themselves automatically, preventing wear on the friction surfaces caused by lateral motion. Design reduces vibration and noise.

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# DIAMOND WHEELS

- **FAST CUTTING**
- **ECONOMICAL**
- **PROMPT DELIVERY**

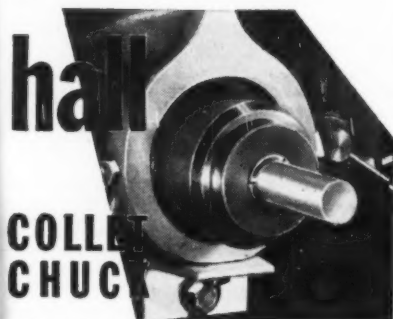
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PLEASE WRITE FOR NEW CATALOG**

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*Diamond*  
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FOREMOST IN DIAMOND TECHNOLOGY



**SPEED UP** production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007 — without adjustments . . . no bearings, friction, heat or loss of power. Instant release without stopping lathe.

2-inch capacity, \$145; 3-inch capacity, \$295;  
1-inch capacity, \$95

Round, square or hex collets, plain-serrated  
**HALL MANUFACTURING COMPANY**  
622 Tularosa Dr., Dept. A, Los Angeles 26, Cal.

Friction linings for both clutch and brake are mounted on removable insert plates which can be replaced easily and quickly without disassembling the clutch. The clutch and brake act as a single unit, preventing overlapping engagement. The brake automatically sets if power or air pressure fail.

The new clutch, identified as Type K, is made in several sizes and is now being installed on most medium and large capacity Bliss mechanical presses. A modified design, suited to installation on older type Bliss presses in the field, is also available.

## **Quick dry rust inhibitor primer**

The Wilbur & Williams Co., 130 Lincoln St., Boston 35 (Brighton), Mass., introduce their new Totrust Instant Dry rust inhibitor primer. This compound is an exceptionally fast dry, penetrating metal primer which assures against peeling, chipping, rusting and to enable recoating ordinarily in from ten to thirty minutes with all standard types of paint as well as rubber base paints, Vinyl coatings and spraying lacquers.

It is used for priming galvanized metal, aluminum, or ordinary metal surfaces, either rusted or clean, damp or dry, painted or bare. Totrust Instant Dry is useful as an all-around primer for paint contractors, to prime rusted spots, galvanized metal, bleeding stains and recoating within ten to twenty minutes with almost any type of paint. It is flexible, and withstands bending, expansion and contraction.

Totrust Instant Dry cuts application time in shipyards, since it has excellent durability against weathering and salt spray. It may be used as a prime coat for products finishing, enabling (without heat) the application of a finish coat of lacquer or enamel in just a few minutes. The compound withstands heat of 350° F. continuously, or up to 400° F. occasionally.

The product is an alcohol solvent compound with a resin base; a fast dry coating especially formulated for toughness and adhesion for galvanized or smooth surface metals. It is said to be safe and effective even when applied over dampness.

# STOP OILY FLOOR MISHAPS



with Tamms

## DRY-IT

Avoid costly accidents caused by slipping on oily or greasy floors! Reduce fire hazards! Replace sawdust or wood shavings with Fuller's Earth. Every shop needs this low-priced safety aid. Fuller's Earth **ABSORBS** oil and grease—and it's noninflammable. Write for **PRICES** and **FREE SAMPLE** to test.

**DRY-IT (Natural Fuller's Earth)**  
**10-44 Mesh**

**DRY-IT (Calcined) 10-44 Mesh**

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**TAMMS INDUSTRIES, INC.**

**228 N. LaSalle St., Chicago 1, Ill.**



## Rogers New ... HIGH SPEED ... Production Grinder

The new **NT-20** rough and finish grinds gear boxes, pump housings, die blocks and countless other flat faces. Many pieces can be mounted simultaneously on the long, variable speed, motor driven table. High HP grinding head motor, automatic cross feed and many other modern features are included. Keep costs down ... keep production up ... write for further information about Rogers NT-20.



## Rogers Handy Carbide Saw Grinder

The type **SC** completely services any carbide tipped circular saw up to 20" diam. and larger on special order. Save production dollars by having an **SC** in your own plant. Write today.

**Samuel C. Rogers & Co.**

Since 1887

**207 Dutton Ave.**

**Buffalo, N. Y.**

## CARROLL and JAMIESON

- 16" Lathe
- 12 Speed Geared Head
- Motor Drive Timken Mounted Spindle
- Modern Design
- Liberal Dimensions

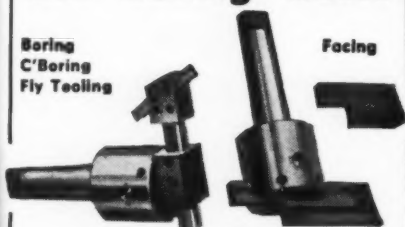
Carroll & Jamieson Machine Tool Co.  
BATAVIA, OHIO, U.S.A.



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for  
Bulletin

## Cut Boring Costs

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C'Boring  
Fly Tooling



Facing

Blind Hole Bottoming

Many enthusiastic users report that the Behr Boring Bar actually pays for itself in the first four weeks of operation. Just ask the man who uses one.

This proven patented bar is chatter proof, extremely accurate and ultra efficient. Has interchangeable blades and accessories. It is unequalled for versatility and efficiency.

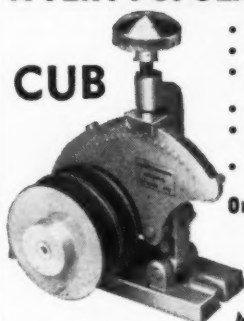


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## A VERY POPULAR DRIVE

**CUB**



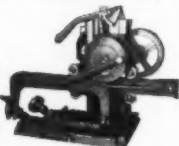
- 3.3-1 Range
- For "A" belts
- Positive alignment
- Ball bearing
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- Ship wt. 10 lbs.

Only **\$18<sup>50</sup>**

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MODEL \$10.50)

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- Lifts on return stroke
  - Ball bearing guide
  - Automatic cut off switch
  - Angle cutting by turning saw. (Saw turns instead of work)
- Price \$112.00 less motor  
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Ship. Wt. 84 lbs.

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These machines are finished according to the work to be done. Send samples or dimensioned drawings and tell us about the cutting qualities of the material and probable production per week or month. Then wait for our reply with bulletin.

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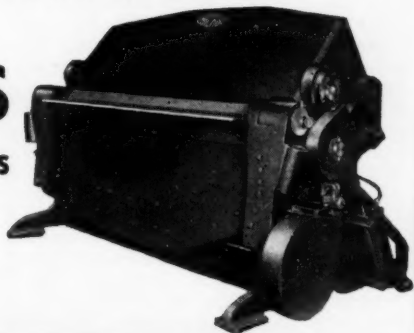
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**BENDING STEEL PLATE  
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Special Bending Brakes  
Double Folder Brakes



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STEEL BENDING BRAKES  
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PRESS BRAKES

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*Since 1849*

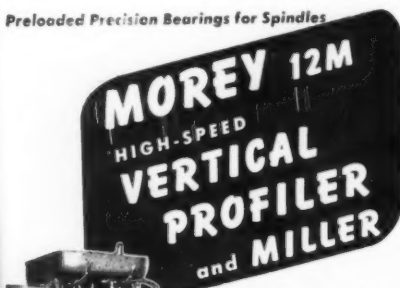
**HOGGSON & PETTIS MFG. CO., 141-H BREWERY STREET  
NEW HAVEN, CONN.**

### Sciaky 3-phase spot welder

A powerful new spot welder, designated as the Three-Phase, Modu-Wave unit has recently been introduced by Sciaky Bros., Inc., 4915 W. 67th St., Chicago 38, Ill. With an electrode force adjustable up to 23,000 lbs., and a rating of only 400 KVA, this machine is capable of exceeding the rigid requirements of the Air Force-Navy Aeronautical Specifications AN-W-30 (MIL-6860) and AN-W-32 (MIL-6858).

Up to two thicknesses of one-quarter inch Aluminum Alloys can now be spot welded with high quality results on a heavy production basis, according to the manufacturer. Extensive tests have proved that the welds obtained on this material surpassed the MIL-6860 requirements in all respects. For instance, on a panel containing 100 spot welds, the MIL-6860 specification will permit a variation in shear strength values of the welds up to 12½%; if cracks or porosities do not exceed 15% of the weld nugget area, these are also acceptable. With the new Sciaky PMCO.

### Preloaded Precision Bearings for Spindles

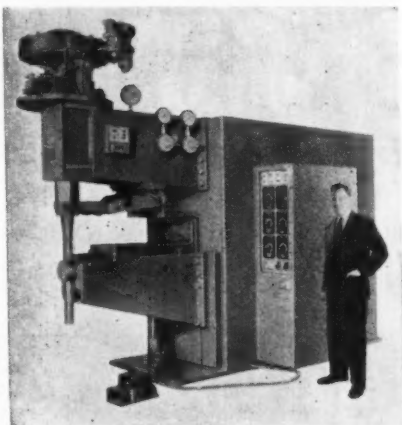


Two spindle or single spindle

Speed and more speed in the production of interchangeable parts requiring milling of any contour or outline is yours in the MOREY 12M. Provision for increased clearance between spindles and table.

**MOREY MACHINERY CO., INC.**  
410 Broome Street New York, N. Y.

6ST machine, shear strength values of plus or minus 7% were regularly obtained, and the weld nuggets were entirely free of cracks or porosities.



A rapid rate of rise of the forging pressure is achieved through the use of a frictionless diaphragm pneumatic pressure system. Without the leathers that rub against the walls of conventional cylinder head machines, friction was eliminated, and quick follow-up pressure was assured. A waveshape, adjustable to suit any given spot welding application, was obtained by virtue of the Sciaky Three-Phase Modu-Wave system, eliminating the necessity of making prolonged compromises between current, timing and pressure sequence.

### Russell cold sawing machine

A fully automatic high speed cold sawing machine, manufactured by S. Russell & Sons Ltd., Leicester, England, has been introduced in the United States by Triplex Machine Tool Corp., 75 West St., New York 6, N. Y. This unit uses saw blades of 22", 24", 26" or 28" in diameter.

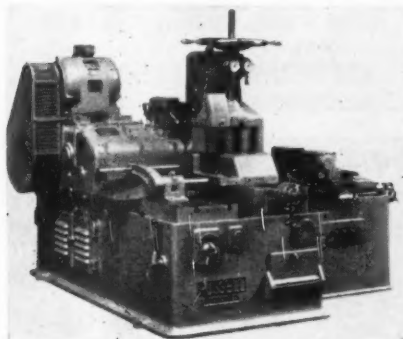
The Russell cold sawing machine employs the "Hydrofeed" locked feed circuit, the principal advantages of which are that the saw blade is prevented from being drawn into the work by its own cutting action, and the steady approach of the saw blade to work, with an equally steady break-through at



the end of the cut, which prolongs the blade life.

The pump and tank unit is a motor-driven assembly housed in the bed. Two pumps are employed, each being totally immersed in the oil tank. The variable delivery pump is controlled by the operator and used for feeding purposes only. A constant delivery pump is used for the feed cylinder counter pressure, work clamping and automatic quick return motion of the saw saddle.

The automatic cycle of operations is hydraulically controlled, insuring the correct sequence of each working operation. The set-up of the machine to cut various sections of components is simple and rapid. The material to be cut is carried between gripper jaws.



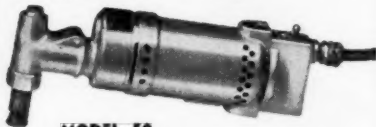
As the cycle begins, the jaws grip the stock which is then moved forward to a distance equivalent to the required length of the cut-off component. The interlocking vises then clamp the material and the saw automatically feeds forward at the rate set by the operator. The grippers automatically release and return to original position. Upon completion of the sawing operation, the saw saddle returns and at the same time the grippers close on to the stock.

The 22"/28" sawing machines are supplied with a feed range of 0-12" per minute. Four peripheral speeds are available; the normal range, in feet per minute is 28, 40, 55 and 70.

## JEMCO --- *Electric Nibblers*



MODEL 75



MODEL 50

For speeding up nibbling jobs, Jemco Electric Nibblers provide an effective and economical solution. Made in two models . . . No. 75 for cutting 14 gauge (.0747). . . . No. 50 for cutting 18 gauge (.0478) hot rolled sheet steel. Other materials in proportion. Jemco Electric Nibblers handle flat or corrugated sheets . . . uneven surfaces . . . and can nibble out corners! Cutting may be started anywhere on the material if access hole for anvil is made. Tools operate on either DC or AC . . . 110 or 220 volts. Feed: 3 feet per minute. Nibbling is done better, easier and faster with Jemco. Send today for full details and informative folders.

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269 WALKER ST. DETROIT, MICH.

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PIONEERS  
and  
PACEMAKERS  
in their line

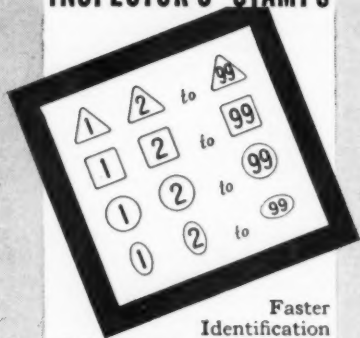


—head rivets from smallest to 1/2" diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—types include Vertical and Horizontal Multiple Spindles.

Write for literature and don't forget to send samples.

THE GRANT MFG. & MACHINE CO.  
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Identification  
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Different borders may be used  
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TAPER PINS  
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## **SawMore** METAL CUTTING MACHINES

**FAST METAL CUTTING  
... MADE EASY!**

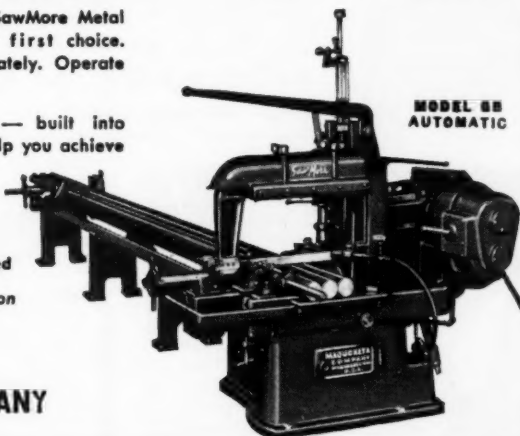
If it's speed you need . . . SawMore Metal Cutting Machines are your first choice. SawMore Machines cut accurately. Operate at lowest cost.

These highlight features — built into every SawMore Machine— help you achieve top production.

- Self-aligning blades
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Write for complete information  
on the advantages of  
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**MAQUOKETA COMPANY**  
CLINTON, IOWA



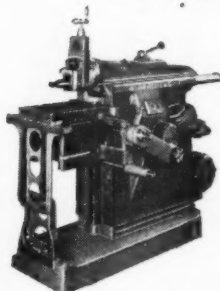
**MODEL 68  
AUTOMATIC**

**16" & 22"**

**HERCULES**

**HIGH SPEED  
PRECISION  
SHAPERS**

**ECONOMICAL • SIMPLIFIED CONTROL**



**16" Shaper**

Automatic Pressure Lubrication.

Cutting Speed Indicator.

6 Speeds, R.P.M. 26-152.

V Belt Motor Dr.

**22" Shaper**

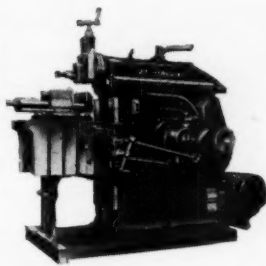
Power Downfeed

Universal Table

Cutting Speed Indicator

8 Speeds, R.P.M. 12-132.

V Belt Motor Dr.



**ATTRACTIVE DELIVERY**

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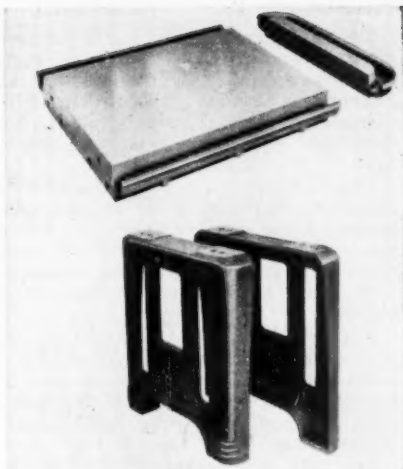
165 S. BARCLAY ST. • MILWAUKEE 4, WIS.

### Delta sectional machine tables

Rigid, sectional tables for setting up special purpose machines or multiple spindle drill presses to fit individual jobs are available from Delta Power Tool Division, Rockwell Manufacturing Co., 605 E. Vienna Ave., Milwaukee 1, Wis.

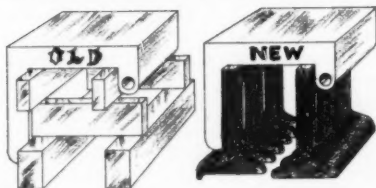
Each table section is 23 $\frac{3}{8}$ " wide x 30" long, and with the addition of the end sections, is increased to 35" long. With these table sections, plants can build up any length table they need. An adequate drain trough for carrying off coolant on wet cutting operations is provided. Each end section has a  $\frac{3}{4}$ " pipe tap for connecting to the coolant system. Cast iron legs are available for mounting the table sections.

On these sections, any type Delta 17-inch or 14-inch drill press head can be installed, and on centers, to meet specific requirements. This means that the operator gets the maximum amount of flexibility—he can have all 17-inch or 14-inch heads, or a combination of both.



Heads can be spaced any distance apart desired, or any special purpose machine can be made up, using customer's own heads or special units.

### EVOLUTION of ELEVATION



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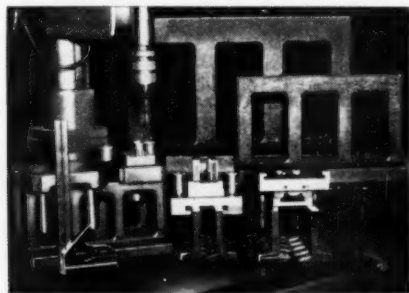
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3 $\frac{1}{4}$ " 4 $\frac{1}{4}$ " 6 $\frac{1}{4}$ " 8 $\frac{1}{4}$ " 10" 16" HIGH



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### Micromatic Turret-Hone unit

To generate accuracy and hold precise tolerances in bores that are short in proportion to their diameter the Micromatic Hone Corporation, 8100 Schoolcraft Ave., Detroit 4, Mich., has developed a compact new type honing unit.

One motor, mounted on the spindle housing, powers both the rotation and reciprocation motions. The unit has a mechanical stroke adjustable and positive up to 2" in length. The self-contained unit is supported by two vertical bars.

For rigidity and maintenance of alignment the fixture is carried by a saddle, supported by the same bars as the head. The saddle has a 6" fall-away from the honing position to the loading position.

For high production, four or six of the units are mounted on a rotating base to make up the Turret-Hone, illustrated above set up for honing automobile connecting rods. The machine rotates continually at 2 r.p.m. The operator stands in one position unloading and loading the fixtures as they pass him. The cycle is as follows:

As the fixture leaves the loading position a hydraulic cylinder lifts it into the honing position. The last increment of travel of the saddle operates a limit switch that starts the spindle rotating and reciprocating. At the same time, the Microdial expands the tool at a controlled, positive rate. If the part is to be clamped, the tool expands to rough bore size and locates the part and the part is clamped just before the unit is put into operation. When the

bore is honed to the desired size the Microsize control stops the expansion of the tool, cycles a runout period, collapses the tool, stops the spindle



and drops away the fixture. When the unit enters the loading position the operator unloads the fixture, slips another part in and the cycle is repeated.

### Rogers NT-20 face grinder

A new, high speed, Medium Duty Production Grinding Machine has been introduced by Samuel C. Rogers & Co., 183-201 Dutton Ave., Buffalo 11, N. Y. The new unit, designated as Model NT-20, has been specifically designed

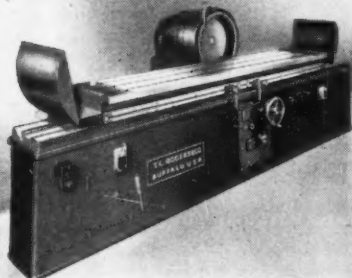


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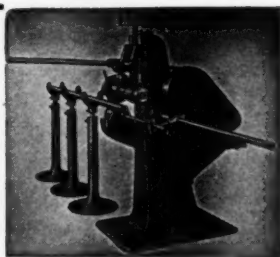
to handle accurate, high speed production grinding, such as pump housings, die blocks, gear boxes, and other flat steel or metal parts and solid sections up to 12" high, 72" long and 16" wide.

Either constant or variable speed reversing motor table drive or variable speed hydraulic table drives can be provided. The variable speed provides table rates from 10 to 70 f.p.m., and is recommended when maximum production and control are desired. Self-aligning, extra-wide (5") v-ways, automatic lubrication and smooth reversals assure consistently accurate and steady table motion as the work passes the grinding head. The new Rogers Grinder is provided with a T-slotted table with work capacity of 48", 60" or 72" long, 16" wide and 12" high.



Either a 20" self-dressing segmental or a 20" cup grinding wheel is provided; power is by a heavy duty 10 h.p. motor. The motor torque and thrust shaft loads are absorbed by a double row of ball bearings. The massive motor base eliminates all motor vibrations for smooth grinding action. The grinding head is fed to the work in desired increments, of from .0005" to .002" per pass, automatically or manually, over precision machined slides.

Coolant water is recommended for all grinding operations, and is supplied on the Model NT-20 by a centrifugal pump. The coolant sump tank has ample capacity to assure proper settling of recycled cooling water.



## *Faster* TUBE & PIPE CUTTING

Steen High-Speed pipe, tube and column cut-off machines embody unique design and rigid construction features to greatly step up cut-off operations. Available in three sizes to cut diameters  $\frac{1}{8}$ " to 3";  $\frac{1}{4}$ " to 6"; 3" to 12".

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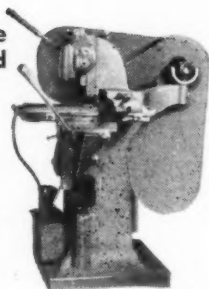
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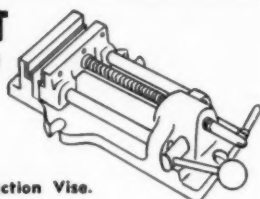


## The JAWSET

Adjustable Pressure Production Vise.

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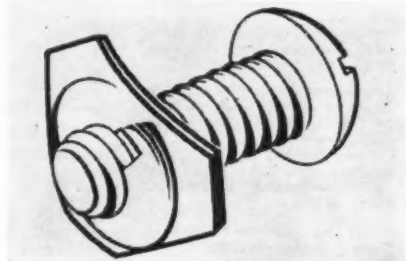


### Retainer acts as self-locking nut

A new type of retainer, designed to act as a self-locking nut on threaded shafts, has been added to the line of Truarc Retaining Rings, made by Waldes Kohinoor, Inc., 47-16 Austel Place, Long Island City 1, N. Y.

Designated as Truarc series 5300, the new triangular shaped retaining nut has a drawn helical segment with a tapered inner edge (see illustration), that forms a single thread conforming with American Standards.

When screwed on a threaded shaft, the dished triangular body flattens under torque and secures an equal load distribution against the part being held. Separate washers are unnecessary. Under spring tension, the threaded



helical segment engages the full depth of the circumference of the screw thread approximately 300°. The retaining nut will remain secure under impacts and vibration.

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**MIGHTY MIDGET RADIUS DRESSER**  
7" Size  
\$41.00 with Diamond

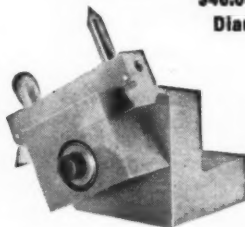


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**MIGHTY MIDGET ANGLE DRESSER**  
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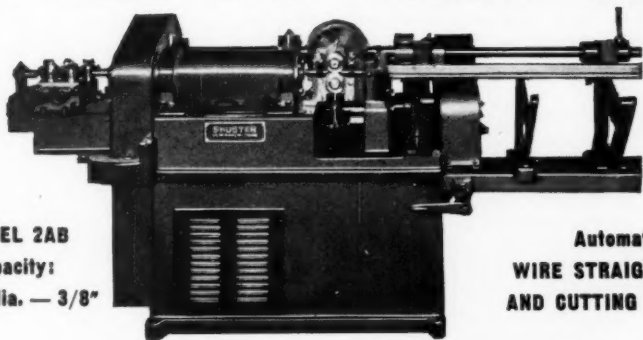
First low cost high precision Angle Dresser on the market. Can be set very accurately with a protractor. Works underneath the wheel. Large bearing surfaces.

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**Capacity:**

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**Automatic  
WIRE STRAIGHTENING  
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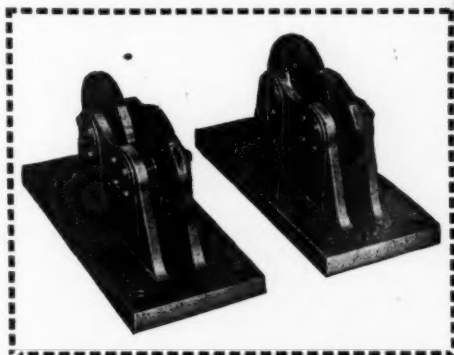
**Shuster Wire Straighteners are available  
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## *Anderson*

### **PILLOW BLOCK BALANCING WAYS**

Especially suited for large diameter work, as a sub-base can be made of proper height to give necessary clearance for work. Anderson Pillow Block Balancing Ways are precision built with chilled iron discs which rotate with minimum friction on sensitive special bearings. Many manufacturers have endorsed them for profitable, efficient, static balancing.



**Built in 1,000, 2,000, 5,000, 10,000  
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Spotters, Hand and Power Hydraulic Straightening Presses**



### Prutton multiple head tapper

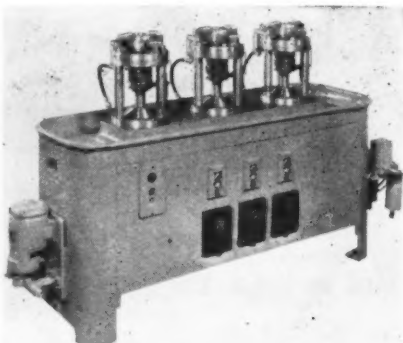
A new multiple head tapping machine with improved mechanical features is announced by the D. H. Prutton Machinery Co., 5295 W. 130th St., Cleveland 11, Ohio. It is specially designed for production threading in range up to 4"-11" pitch and for particular use on shells, tubing and all fine pitch threads.

The new Model No. 40A is powered by three separate drive, three h.p. motors to insure ample power for uninterrupted cutting during tapping. Separate drives permit the operation of one spindle or all three in sequence for fast continuous feeding by timing changes for work pieces between thread cutting cycles.

Fixtures are operated by air and controlled by a limit switch, a mechanical feature that coordinates with other improvements designed to increase machine efficiency.

The old lead screw has been replaced by a master cam to permit the use of collapsible taps. The tap fed by

master cam rises to the work piece held by a special fixture at the correct speed, which is prearranged on a combination speed pulley attached to each drive. After threading is completed,



the tap collapses and the master cam is in position to alter feed for facing and chamfering. The master cam is continuous to clear the head from the work piece and reset for the next cycle,

### YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, inches	Opens inches	Weight Pounds
1D	3 1/2	3 1/4	12 1/2
2D	5	5 1/2	23

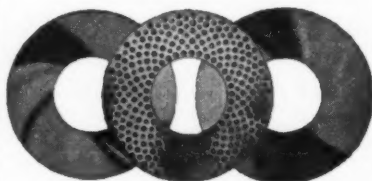
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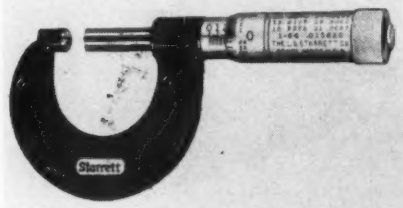
thus the need for reversing is entirely eliminated.

The lubricant in the reservoir is pressure fed through separate feed lines for each head. A ring in the tapping fixture with four perforations directs the flow at an angle on four sides of the tap. Flow starts before thread cutting and is continuous throughout all threading cycles.

Approximate machine dimensions are 72"x24" and height is 4 feet overall. It is built with the necessary solid weight and size to be free of vibration when all three heads are in operation.

### Micrometer with rounded anvil

A useful micrometer, recently introduced by The L. S. Starrett Company, Athol, Mass., is used for measuring the wall thickness of bearings, tubing and various cylinders having walls up to 1" thick and any diameter all the way around to  $\frac{5}{8}$ " i.d. Since the anvil contact is rounded, any of the above curved surfaces can be accurately measured in thousandths of an inch. Conventional micrometers having flat contact faces cannot be used for this purpose, according to The L. S. Starrett Company.



The frame is strongly ribbed and finished in smooth black enamel which is easy to keep clean. Thimble and sleeve have rust resistant, "Satin Chrome Finish," a matté chrome, no-glare finish against which markings stand out sharp, clear and easy to read under any illumination. Graduations are quick reading with every thousandth numbered for fast, error-proof reading. A complete table of decimal equivalents is conveniently stamped on the thimble. The spindle is of one piece construction with threads hardened, stabilized and ground from the solid.



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## 100" gear shaving machine

A new Red Ring Gear Shaving Machine for both internal and external spur and helical gears with face widths up to 40" and pitch diameters up to 100", is announced by National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. It is especially applicable to gears used in tanks, power shovels, mine hoists, large speed reducers, stationary prime movers and marine drive units.

Shaving is accomplished by the rotary crossed axes principle with the work gear driving the cutter, as is customary in shaving gears larger than 24" pitch diameter.

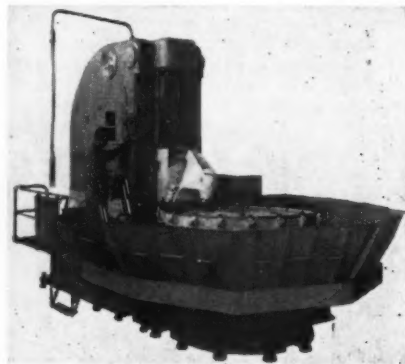
The general design includes an independently driven rotary work table and a column which, moving horizontally, carries the cutter head to and feeds it into the work. The cutter head reciprocates in its vertical slide across the face of the work.

The work gear, with its axis vertical, is clamped in a fixture mounted on a large rotary work table. There are no projecting machine elements above the table to interfere with handling heavy gears as they are loaded. Table speed is selective over a wide range by means of change gears.

The column, which carries on its forward end the cutter head assembly, moves horizontally and is supported throughout its full travel on hardened and ground slide ways in the machine base. The approximate bearing pressure on these ways is 15 lbs. p.s.i.

The column is provided with power rapid traverse in both directions in order to bring the cutter head into ap-

proximate cutting position and to retract it. An electric control automatically stops the rapid advance of the column just short of engagement between the cutter and the work gear. Actual engagement is done by a hand wheel which is also used to feed the cutter into the work during the shaving operation.



The cutter head slide, provided with power rapid traverse and power feed, both reversible, is mounted on a tilting mechanism which can be adjusted to assure the path of reciprocation being in exact parallel with the work gear axis. This mechanism is also used when it is desired to taper shave the work gear teeth. A dial indicator shows the exact amount of taper in .001" of gear face width.

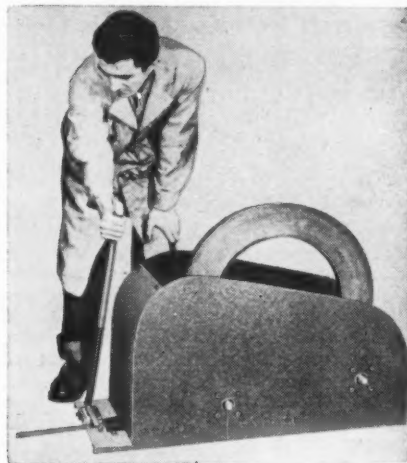
The cutter spindle is carried on precision anti-friction bearings designed for rigidity and minimum overhang.

A vertical adjustment on the cutter head eliminates the need for crossed axes point spacers, as well as facilitating easy cutter removal. The cutter head is adjusted angularly through a total arc of 30° to obtain any necessary crossed axes setting.

A central push-button station and selector switch is located on the machine's side; a duplicate set of controls is suspended from a swinging overarm for convenience of the operator in loading and in setting up.

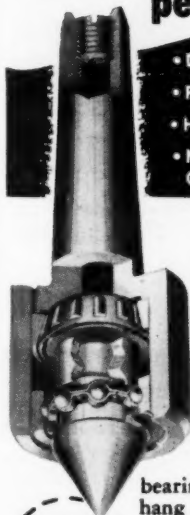
### Gerrard steel strap dispenser

An electric motorized dispenser for ¾" and 1¼" heavy duty steel strap has been developed by A. J. Gerrard & Co., Melrose Park, Ill. The unit may be located in any convenient spot; it uncoils the strap along the floor so that when the desired length has been obtained, the operator can cut it off with the manually operated shear. What was formerly a two-man operation now becomes a one-man operation with the Model 430 Coil Dispenser.



The dispenser is easily loaded by rolling a coil of strap into the cradle and threading the end of the strap through the dispenser. Positive chain drive is employed with a 110 volt a-c motor. Special motors for special currents are also available.

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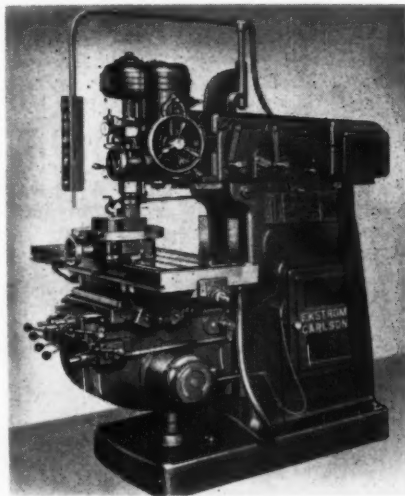
DEPARTMENT OF GENERAL ELECTRIC COMPANY

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Detroit 32, Michigan

**Ekstrom, Carlson  
universal milling machine**

The Model 5V Vertimil, manufactured by Ekstrom, Carlson & Co., Rockford, Ill., has recently undergone several improvements both in scope and capacity. The improved 5V Vertimil now features a ram-type head, a swivel head, a sliding spindle, a swivel table, and a four-way power feed mechanism. Besides these advantages, it is provided with a wide range of longitudinal, cross and vertical feeds, and twelve speeds ranging from 36 to 1240 r.p.m.



The machine consists essentially of a base and column casting, a horizontally adjustable ram which is mounted on the column and arranged to support a swivel sliding spindle head and spindle drive, and a tilting work table mounted on a saddle and knee assembly arranged to provide longitudinal, cross and vertical movement of the table, all power driven.

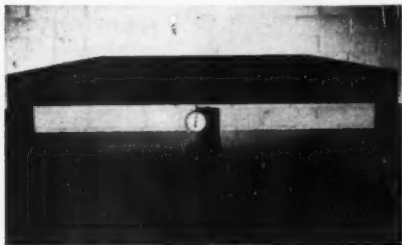
The combined adjustments of the tilting spindle, the tilting table and the ram type head provide all of the advantages of several different milling machines in one compact unit. The head and table can both be tilted, and by simple controls, the table can be moved crossways or longitudinally. With these

adjustments, the operator can mill flat, vertical, horizontal or angle surfaces.

The range of the Model 5V Vertimil includes a longitudinal range of 29", a cross range of 13" and a vertical (knee) range of 16". Eight longitudinal feeds are provided, of from  $\frac{3}{8}$ " to  $12\frac{3}{4}$ "; eight cross feeds are also available, of same range; two vertical feeds of  $3\frac{1}{4}$ " and  $5\frac{1}{4}$ " are provided. Overall table size is 20" x 56"; working surface is 20" x 48". All controls are conveniently located in front of the knee. The drive motor is a 3 h.p. dual speed unit; the table feed motor is a 2 h.p., 1200 r.p.m. unit. Overall height of the Model 5V is 90"; overall width is 67"; overall depth is 92".

### Granite surface plates

The Baldridge Company, P. O. Box No. 506, Montrose, Calif., has recently introduced its line of precision granite Surface Plates, in five standard sizes, ranging from 12"x18" up to 32"x52". According to the manufacturer, "these useful devices are 'as hard as glass yet tough enough to resist damage from straightening a nail.' They are finished to extremely fine tolerances, too smooth to cause a 1/10,000" indicator to flicker, yet deep enough to prevent sticking of



height gage or work piece. The illustration shows a Baldridge Surface Plate with an indicator resting on top of it, showing its extreme accuracy.

These surface plates are furnished with either two or four clamping ledges, according to the size of the plate. Larger plates, measuring 4' square 4'x6' and 4'x8' are also available. All standard plates are finished with an accuracy of .00005" or better. Odd sizes are also available finished to customer's dimensions and tolerances.

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**Cold Pipe, Conduit and  
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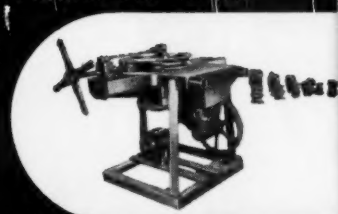
**RADIANT HEAT BENDS**

**in Standard Pipe**



Hand-Powered "American" A-30

Fast . . . Accurate . . . Average bend takes only 18 seconds! Up to 180° bends . . . all sizes from  $\frac{1}{2}$ " to 2". Usual radiant heat bends for  $1\frac{1}{4}$ " at 6" and 9" radii can be supplied. Only 7 parts. Standard radius 5 times pipe size. Occupies 18" x 18" floor space.



Motor-Powered "American" 2PB

Capacity  $\frac{1}{2}$ " to 2" standard pipe . . . Standard radius 5 times pipe diameter up to 180° . . . Maximum radius 13". Complete with rolls for each size pipe. Standard motor equipment 2 h.p.

Special radii  
supplied on  
request

**"American"**

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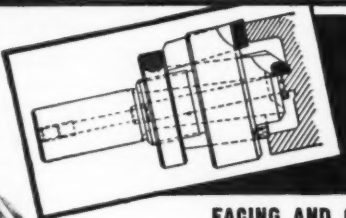
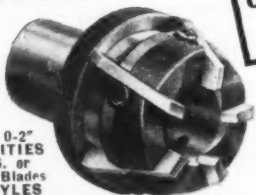
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T.C.T. Blades  
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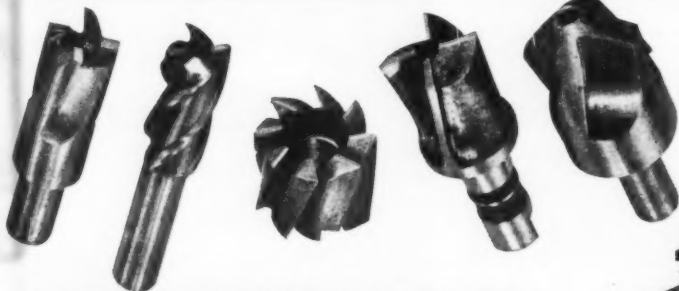
**FACING AND COUNTERBORING TOOLS**

STD. 1/4" to 4"  
DIAMETERS  
INTERCHANGEABLE  
PILOTS H.S.S. or  
T.C.T. BLADES



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## WORK DONE BY THIS AUTOMATIC FLUTEMILLER

- Mills straight and spiral flutes
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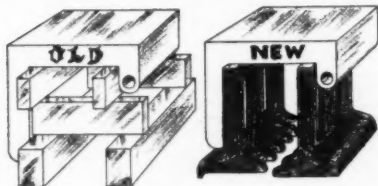
CLEVELAND 9, OHIO





## Magic Parallels save man hours

An ingenious time-saving device which is of definite use to tool and die makers, machinists, inspectors and layout men, is the Magic Parallel, recently introduced by Magic City Machine Tool Co., 2128 S. Walnut St., Muncie, Ind.



According to the manufacturer, the Magic Parallel is a machine tool accessory of unquestioned advantages over the old "bars of steel" method, for the ease and convenience in handling due to its light weight, narrow top surfaces and no-tip features. It is most useful on drill presses, planers, milling machines, surface plates, jig borers, or wherever one plane surface needs accurate, parallel elevation from another.

The Magic Parallels are furnished in six convenient sizes: 3 1/4", 4 1/4", 6 1/4", 10" and 16" in height, and in proportionate lengths, of high grade semi-steel, and accurately ground.

The new and growing practice of elevating work on the bench, making it possible to work under and over, and all around the job, in assembling, driving dowel pins in or out, fitting sections to punches and dies, shearing in and extracting punches, etc., make the Magic Parallels a new necessity for bench as well as machines.

### MATERIALS QUIZ

Answers to quiz on page 231

1. Hardens
2. Cold
3. Iron or steel
4. Cast iron, ferro steel, cast steel
5. Zinc
6. Lead and tin
7. Can be hammered to shape
8. Galvanized lead lined
9. Less affected by mineral action
10. Cooling in water

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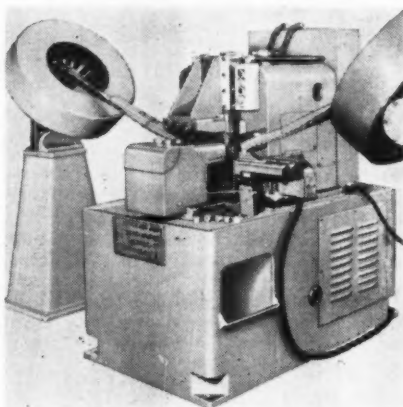
**TULSA, OKLAHOMA**

Phone 7-3337

P. O. Box 7157

## Motch & Merryweather Cam Automatic

The Motch & Merryweather Machinery Company, 715 Penton Building, Cleveland 13, Ohio, has added a second model to its line of cam automatic forming machines. All machine functions are mechanically controlled by one main camshaft. The model illustrated below turns the o.d. and cham-



fers one end of laminated silicon steel motor rotors. Varied lengths of any one diameter can be handled. The machine cycle is as follows:

Cam-actuated loading mandrels automatically locate in the center hole of each piece and force the piece against the hardened drive spurs mounted on the face of each spindle, while the magazine slides retract and reload. The tool slide, mounting quick change tools, rapid advances downward to position and feeds horizontally across the diameter of the work.

The tool slide is then withdrawn rapidly to dwell position where a second tool chamfers the trailing edge of the piece. The cam-actuated loading mandrels are then withdrawn from the work-pieces, allowing them to fall into take-off chutes which convey them by gravity to a tote box. Two more work-pieces are then brought to loading position by the magazine slides as the cycle is completed and repeats. Production is 800 pieces per hour.

Motch & Merryweather cam auto-

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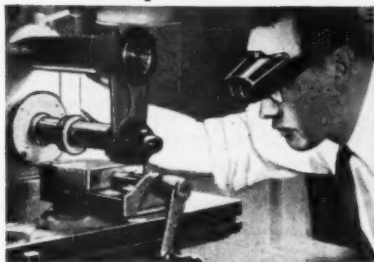
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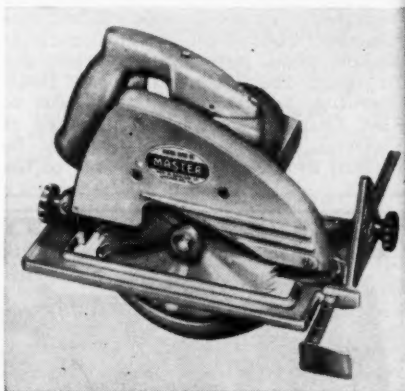
matics can be furnished with hopper or magazine feed. Where long pieces are to be formed and cut off, a hydraulically operated bar feed can be included. The main camshaft in all M & M automatics has its own drive motor, as has each of the two spindles.

### Master-Taper portable 6 1/4" saw

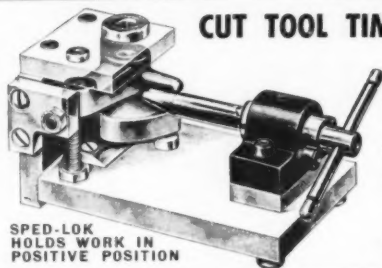
A new electric portable circular saw has been announced by the Master-Taper Co., 4531 N. Beacon St., Chicago 40, Ill. The Ramsaw is equipped with a 6 1/4" blade which permits cutting through 2-inch stock on a 45° angle. The 3/4 h.p. motor is housed in a light weight aluminum housing, placed at the left of the blade for balance and easier cutting. A built-in bevel and depth adjustment are integral parts of the saw; they are easily adjusted and remain accurate.

The Ramsaw features a plastic window in the guard which allows the user to see the line of cut in safety at all times. An adjustable rip fence extends to 8 inches for precision ripping.

A safety trigger switch in the handle cuts off the motor when the operator's finger is removed from the switch. The lower safety guard covers the blade at



all times and cannot become clogged with sawdust. The Ramsaw has a self-lubricating heat treated alloy steel motor shaft and drive gears.



SPED-LOK  
HOLDS WORK IN  
POSITIVE POSITION

## CUT TOOL TIME—PRODUCTION COSTS WITH Sped-Lok

- Makes it possible to build jigs and fixtures in skeleton form thus permitting chips to be more easily removed.
- Cam, on end of cam sleeve, automatically compensates for variation in size of work.
- Cam sleeve adjustment screws allow precision setting after mounting.

**CHARLES GREEN CO.**  
1324 ROSCOE ST., CHICAGO 13, ILL.

### DoAll diamond tooth band

Refractory, ceramic, vitrified and vitreous materials can now be cut directly to a layout line with a precision comparable to that of conventional contour sawing. The DoAll Company, Des Plaines, Ill., announces that the new Diamond Tooth Band is capable of cutting directly to a desired contour, making possible savings of valuable material which is removed in sections, rather than in chips. It eliminates the conventional method of shaping the material to form by multiple cuts with diamond wheels, or successive rough and finish contour grinding operations.

DoAll Diamond Tooth Bands are manufactured with precision accuracy to provide surface smoothness and fine tolerance cutting on products such as carbon, glass, porcelain, firebrick, etc. In using the Diamond Tooth Band, operating speeds range from 3,000 to 8,000 f.p.m., depending on the type of material being cut. Coolant must be flushed around the cutting edge of the

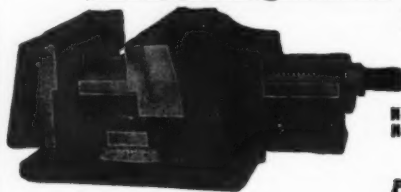
diamond tooth band in order to wash away particles of material cut.

The diamond-charged cylindrical matrices are irregularly spaced on the



band to prevent setting-up resonating patterns as the sharp cutting diamonds enter the work. The combination of

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The Shaper Vise has graduated swivel base and tongue in center to fit slot in table, and has holes for bolting down. In ordering this vise give size of slots in Shaper Table, also distance from center to center of slots.

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## AMAZING . . . NEW . . .

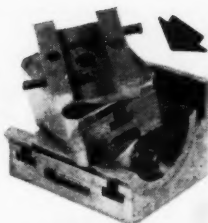
### Compound angles without parallels

Yes, you can now grind compound angles in your tools without the use of angle parallels, without charts or books, without involved mathematical computations. You will save time and

money through easier and faster grinding. By using this vise for carbide sharpening you will save valuable carbide which is usually lost when free-hand grinding. Easy to use. Use on any surface grinder.

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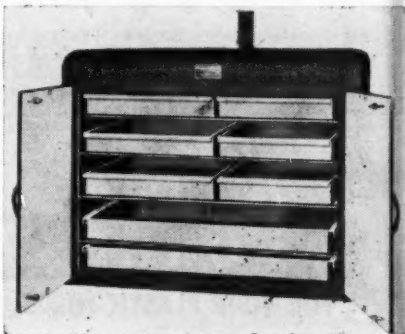
## COMBINATION VISE and JIG CO. ORFORDVILLE WISCONSIN

non-resonating teeth and the mechanical ability of the DoAll Contour-matic Machine makes it possible to produce smooth cuts with an accuracy comparable to a coarse grit lapped surface. For this reason, the Diamond Tooth Bands are recommended for use only on the Contour-matic, which has the necessary features of vernier controlled work feed, flush coolant for the band, maximum rigidity, and infinitely variable speed range. The DoAll Diamond Tooth Band is available in four band widths, 1/4" to 1" wide.

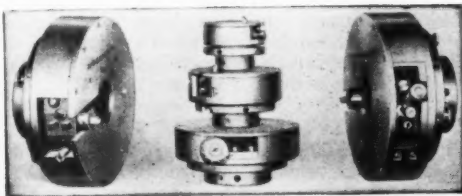
### Portable electric oven

A new model portable electric oven with four shelves which provide for shelf processing has been introduced by Grieve-Hendry Co., Inc., 1101 N. Paulina St., Chicago 22, Ill. The shelves have room for eight 2" deep by 12" wide by 23" long drying pans. Products or materials can be placed directly on the shelves if desired. The oven is ideal for preheating plastic granules, treating powdered metals, for baking small electronic components, etc.

The portable feature permitting easy movement from place to place and the use of these ovens close to machines, has eliminated considerable handling and hauling. As the oven operates from any 110 volt outlet, no special wiring is required.



Construction is all steel, with air-cell asbestos insulation. Uniform temperature is provided throughout the oven



### MUMMERT-DIXON FACING HEADS

**with Automatic Feed**

One-way Tool Feed — 6, 9 and 10" sizes.

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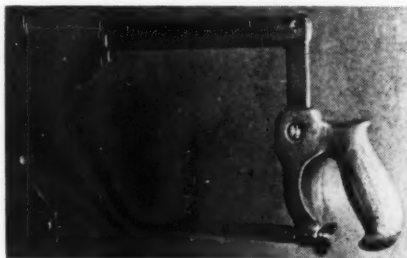
by forced air circulation. A motor driven fan draws in fresh air and drives out the stale air through specially located vents. This avoids stratification and makes the oven practical for any dehydration or baking process.

The inside size of the oven is 29" x 24" x 20½" high. Four expanded metal shelves and a drip pan are standard equipment. Drying pans are extra. The unit comes ready to operate. It is capable of heating to 225° F in 15 minutes.

### Expandable hack saw

An ingenious device which should be of widespread interest to shop men and electricians is the "Hi-Lo" Hack Saw, recently introduced by Mansfield-Zesiger Manufacturing Co., Cuyahoga Falls, Ohio. This versatile tool will cut a variety of shapes and contours, up to large diameter pipes.

Unlike the ordinary hack saw, this tool is equipped with an expandable device, permitting the original clearance of 3½" between the saw blade and the frame to be increased to 7". This feature permits an unusually large clearance in sawing operations, as well as giving greater visibility for the operator.



The tool is also provided with a knuckle guard, giving protection against skinned knuckles. The "Hi-Lo" Hack Saw expandable feature adjusts in only five seconds, providing the operator with a deep back saw.

The appointment of T. C. Finnell as assistant manager of the application engineering department for the Westinghouse Electric Corporation's Motor and Control Division, Buffalo, N.Y., has been announced by A. H. Heywood, manager of the department.



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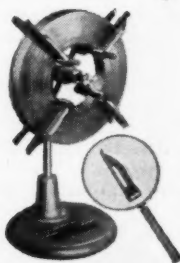


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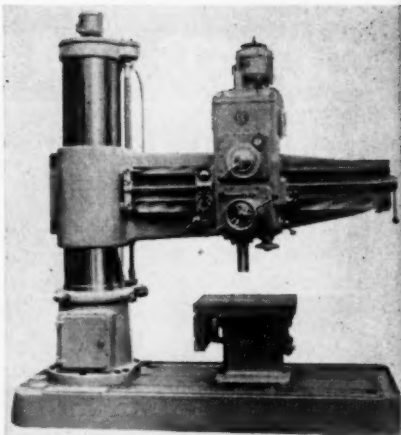
**ROLL FEEDS CORPORATION**  
Pawtucket -:- Rhode Island  
Builders of "RFC" Roll Feeds

## Cosa introduces Kolb radial drills

The Cosa Corporation, 405 Lexington Ave., New York 17, N. Y., is introducing in the United States the Kolb Line of radial drills. These machines are made in various capacities for light, medium or heavy duty drilling operations.

These radial drills are provided with hardened and ground gears sliding on hardened and ground spline shafts, rotating on ball bearings. Time saving features include an electro-hydraulic clamping system for rigid locking (automatically or by hand) of the column and spindle head, push button controls and a speed selector—all centrally located on the head. These machines can be equipped with a device for the preselection of feeds for a sequence of rough and finish drilling, reaming and tapping operations.

The machines have various capacities for drilling cast iron from 1½" to 8" in diameter, maximum drilling radii from 27" to 180". Column diameters are



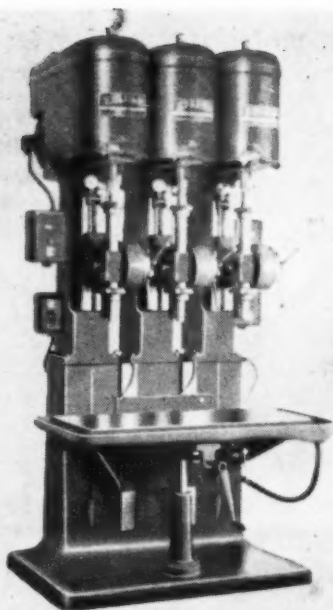
from 7½" to 35". All these radials have ample ranges of speeds and feeds. The Kolb Model NKR53 radial drill illustrated above has twelve speeds from 30 to 1500 r.p.m. and twelve feeds from .003" to .118" per revolution.

## Edlund drilling and tapping machines

A new line of Variable Speed Drilling and Tapping Machines has been introduced by the Edlund Machinery Co., Cortland 6, N. Y. These Model 2F machines provide a wide selection of speeds in drilling and tapping. The infinitely variable speed drive allows the operator to select the correct speed, within a broad range, for maximum tool life and greater production. The usual, restricted three, four or eight speeds are eliminated.

Production is reported to be increased by as much as 25%, and more in many instances, by the use of infinite speeds. The speed changes in the Edlund Model 2F are effected instantly by a handle-controlled mechanism, eliminating loss of production time by stopping to change belts or gears. An indicating dial shows the speed selected. Spindle speed ranges from 200 to 2700 r.p.m. are standard; additional speeds from 50 to 675 r.p.m. are obtained with back gears. The capacity is  $\frac{3}{4}$ " in steel ( $1\frac{1}{2}$ " with back gears) and  $\frac{7}{8}$ " in cast iron ( $1\frac{1}{4}$ " with back gears). The standard Model 2F machines are also available with 1, 2, 3, 4, 5 or 8 spindles, in pedestal or round column types, and with 8" or 15" overhang distance from the face of the column to the center of the spindle.

Additional equipment for the new machines includes semi-automatic power feed that automatically engages as the drill touches the work; a reversing motor tapper capable of tapping 30 holes per minute and reversing at the same depth within one-quarter turn of



the tap, essential in bottom tapping; a lead screw tapper with adjustable stops and interchangeable pick-off gears, which reduces human errors and results in higher quality finished tapped holes.

A. J. Fischer, director of research and development, Adamas Carbide Corporation, Harrison, N.J., announces the appointment of H. C. Gross to the position of Chief Chemist.



## THESE HANDNIBS LEAD IN POPULARITY

These indispensable handymen of the shop shear and nibble (outside and inside) up to  $\frac{3}{16}$ " flat stock; openings for cutting  $\frac{3}{16}$ ",  $\frac{1}{4}$ ",  $\frac{5}{16}$ ",  $\frac{3}{8}$ " rods. No. 5 also punches up to  $\frac{1}{2}$ " holes in  $\frac{1}{8}$ " stock. No. 4 available for bench or vise mounting; No. 5 standard or swivel bench mounted. Write for full details or ask your dealer for a demonstration.

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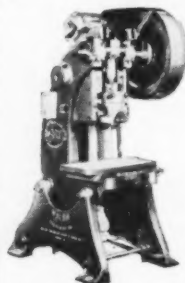
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## "Cam Action" dogs for grinders and lathes

The Ready Tool Company, 550-B Iranistan Ave., Bridgeport, Conn., claims that their new patented "Cam Action" Grinder and Lathe Dog will increase production and efficiency by saving time and labor, particularly on semi-automatics and where little traverse feed exists. They are easy to adjust with instant, positive action, according to the manufacturer. A concealed spring holds the cam to the work; thus, the harder the drive, the tighter the grip.



For grinders, the cam face is accurately ground smooth, both surface and contour, positively protecting the work from mars, thus eliminating spoilage and rejects. On lathes, the cam face is serrated to prevent slipping. Construction is steel with a specially hardened cam face and set screws. The dogs are also available with brass cam and screws for use on grinding machines.

Use of the dog saves time, since all that is required is to place the work in the dog, holding the cam against the spring tension with a finger, and set the two screws. Release the cam and the work is held securely by the cam

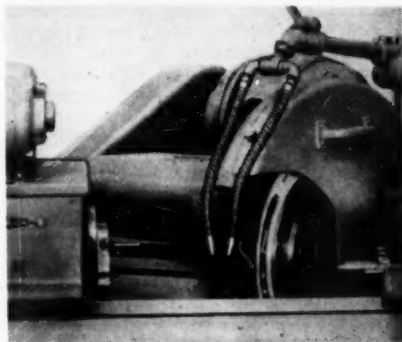
spring action. To remove the piece, just release the cam. In mass production it is recommended that several dogs be on hand; while one dog is being used, a second dog can be put on the next piece. Sizes are made to accommodate diameters from  $\frac{1}{8}$ " up to 6" capacities.

#### "Sealflex" metallic tubing

A new flexible metallic tubing has been developed by the Vermont Flexible Tubing Co., Lyndonville, Vermont, under the name of "Sealflex," designed to provide a leakproof feed line for oil, coolants or solvents. Because of its special construction, "Sealflex" will bend to any position and will stay put without support. In fact, the more it is bent, the tighter the seal.

Machinery manufacturers and designers with the problem of providing a feed line to machine parts in constant motion, have recognized the superior features of "Sealflex" metallic tubing in delivering a steady stream of coolant or lubricant to the work-piece. "Seal-

flex" is made to withstand stress and strain, change in volume of flow and machine vibration. It can be bent, adjusted to the job, the angle or position changed by a touch of the fingers.



"Sealflex" Metallic Tubing is available in five sizes and can be provided with male or female couplings, nozzles, stopcocks and unions or fitted to customers specifications.

for greater **RIGIDITY**  
more **ACCURATE** cuts



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**CRITERION**

**CRITERION**  
*machine*  
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HEADS**

A full line of adjustable boring heads and bars now available. Heads  $1\frac{1}{2}$ " to 7" dia. Carbide or high speed bars  $\frac{3}{8}$ " to  $1\frac{1}{4}$ " dia. Lead screws ground **AFTER HARDENING**. Ample bearing surface, heat treated parts, interchangeable shanks. Criterion tools are the criterion. Write for free catalog and costs.

9312 SANTA MONICA BLVD. • BEVERLY HILLS, CALIF.

## Wohlhaupter boring & facing head

Karl A. Neise, Dept. AM, 381 Fourth Ave., New York 16, N. Y., announces the Wohlhaupter Universal Masterhead, a precision boring and facing head, suitable for boring mills, radial drills, lathes, milling machines, and other machine tools. Boring, facing, recessing, undercutting, taper and form turning, threading of stationary work can be performed with one head, on one setting.

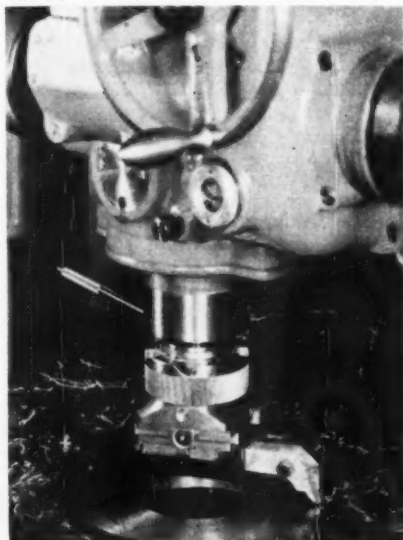
All parts are hardened and ground, and sliding parts lapped to insure precision and long life. Integration of shank and body as a single piece results in a sturdy safe tool suitable for heavy cuts as well as for delicate precision work.

Self-acting slide feeds with automatic end release and precision settings guarantee accurate close-tolerance work, smooth surface finish, and straight faces. For additional safety of operation, automatic end release can be adjusted for specific cutting pressures, to release whenever excessive pressure arises, due to dull or broken tools. Tapers may be bored by using cross feed in conjunction with axial feed of machine spindle or table. The slides move in both directions, to the extent of half their adjustment beyond the central axis of the head. Thus, widest possible adjustment of tool slide is possible without destroying the balance of the head.

The Masterhead is available in seven different sizes to cover a range of work diameters up to 24.4", and can be supplied with standard Morse or Brown

& Sharpe shanks, or on order to fill special shank requirements.

Models UPA1, UPA2, and UPA3 for work diameters up to 10.2", are equipped with one automatic slide feed.



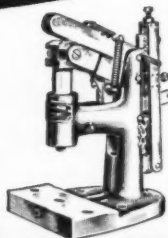
Coarse and sensitive settings are made by means of a graduated collar. One graduation of sensitive setting screw corresponds to a slide feed of .0005", or .001" on diameter. One revolution of the sensitive setting screw corresponds to a slide of .020" or .040" on diameter.

Models UPA4, UPA4-S5, UPA5, and UPA5-S6 designed for bigger ma-

## HIGH-SPEED

### COLD RIVETERS

Thousands of our happy users originally started with us by submitting sample assemblies of their riveting work. Without charge we studied their particular problem, and returned the assembly properly riveted with complete analysis recommendations and quotations. It's a FREE service, that may save you time, materials and spoilage—and speedup production. Why not write us?



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Anything for staking or riveting fixed or movable joints—anything in eyeletting, grommeting, burring, pointing with platinum, tungsten, silver—whatever your problem, we can help you. No obligation. Write us.

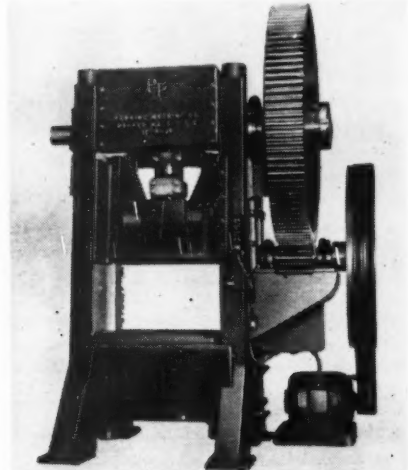
HIGH SPEED Hammer Co., Inc.  
311 Norton St.  
Rochester 21, N. Y.



chines and heavier work, up to a diameter of 24.4", are each provided with four automatic slide feeds: viz. .00125", .00250", .00375", and .00500". The feeds are engaged by means of the retaining pin and the push buttons, the feed control collar being kept in place by hand or by means of the stop rod. The return movement of the slide is engaged by reversing the facing traverse or else by turning the quick setting screw a few revolutions by hand.

#### Perkins straight side press

The new Model 12-H-36 Straight Side Single Crank Press has recently been announced by Perkins Machine Co., Warren, Mass. Sturdily built, to give years of dependable service, this model, with its capacity of 200 tons, meets modern requirements for economical operation and low upkeep.



The press has a bed area of 36"x36", with an 8" diameter main bearing. It is designed for convenience of operation and for easy accessibility in changing dies. This large bed will accommodate a wide variety of work, and the rigid press construction throughout, is characteristic of the Perkins line... which includes blanking presses, straight side single and double crank presses, gap type, wheel on the back presses, dial and roll feeds, etc.



**HORIZONTAL  
or VERTICAL**



**Model  
"400"**

**4"  
ABRASIVE  
BELT GRINDER**

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**THE BILLINGS & SPENCER CO.** Hartford 1, Conn., U.S.A.  
Specialists in Drop forgings of all kinds since 1869

**Accurate Hole Transfer Made Easy With  
NIELSEN TRANSFER SCREWS**

Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 8 sizes, from  $\frac{1}{16}$ " to  $\frac{3}{4}$ " U.S.S. Inexpensive — Last for years.



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**NIELSEN TOOL &  
DIE COMPANY**  
1962 W. Eleven Mile Rd.  
Berkley, Mich.

**Electronic micrometer  
accurate to .00002"**

Rapid and accurate measurements to a tolerance of .00002" are claimed for the Carson-Dice Electronic Micrometer, manufactured by J. W. Dice Co., 1 Engle St., Englewood, N. J. An electronic circuit used in conjunction with an accurate micrometer head permits "pressureless" measurement and eliminates "feel" as a source of error. The electronic circuit is sufficiently sensitive to give a positive "on and off" indication with only five millionths of an inch (.000005") displacement at the contact. Several models are available with different work capacities for measurement on compressible or noncompressible materials either conducting or nonconducting in nature. All models are portable, require no levelling and are said to be unaffected by vibrations, variations in temperature, line voltage or aging of electronic tubes.

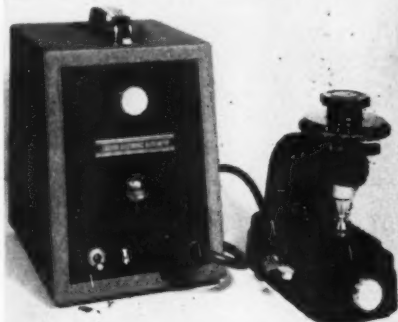
The Carson-Dice Micrometer can be used for rapid measurement of machined parts, ball bearings, small as-

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CUTTING TOOLS  
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CUTTING FLUID**

**D. A. Stuart Oil CO.**

2749 South Troy Street, Chicago 23, Ill.

semblies, depths of counterbore. It can also be used to measure deflection in diaphragms, bi-metal elements, springs, bellows and similar applications requiring measurement without pressure.



This instrument is stated to offer the only means of measuring soft or compressible materials precisely. It can be applied to paper, foil, rubber, felt, plastic sheets, film and textiles with equal ease.

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Exclusive Duplicating Process  
ONE CAM OR A QUANTITY**

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**READING BENCH  
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Portable — move directly to job; a time saver for both small and large shops.  
3 3/4" stroke; adaptable for other work.  
Low first cost — prompt delivery.

Good dealers wanted.

**Reading Machine Co.  
Reading (Cincinnati) Ohio**

### Dial indicator features twin contacts

A new dial indicator with enclosed end to prevent dirt and chips from entering into the mechanism and causing the pointer to stick has been placed on the market by Superior Indicator Co., P. O. Box 734, Rochester 3, N. Y. Chrome plated and rust-proof, the indicator is made with a double face, permitting it to be read from either the front or back.

The outstanding features of the indicator are its twin contacts. The 1/32" hardened contact is threaded and telescoped inside the larger 1/8" contact. If the work requires a fine point, the 1/8" contact can be removed by unscrewing it, leaving the 1/32" contact ready for use. The circular inset at the



upper left in the illustration shows the threaded stud with the 1/32" contact ball on the end. The indicator at the right shows the 1/2" long extension—1/32" contact screwed over the short 1/32" contact which is telescoped within.

If the work to be tested requires a more sturdy contact, the 1/8" contact is simply screwed over the 1/32" contact. The telescoped contacts save time and make the instrument more adaptable. Non-magnetic tips, 1/8" in diameter, are also available.

### ELIMINATE HUMAN ERRORS WITH INDICATING MICROMETER & COMPARATOR

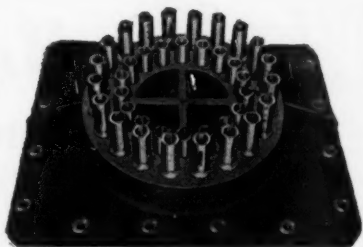


COMPARATOR  
MASTER  
MICROMETER  
GO-NO GO GAGE  
1" RANGE IN  
1000ths - NO GAGE  
BLOCKS NEEDED

\* HUMAN ERRORS THROUGH  
DIFFERENCES OF "FEEL"  
ELIMINATED.  
WILL DETECT OUT-OF-  
ROUNDNESS, OVALNESS  
AND TAPER.

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Pictured: a 38-Spindle Heavy-Duty  
Drill Head

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Send us samples for grooving. We will return them cut to specifications, with a record of time and cost estimate. No obligation.

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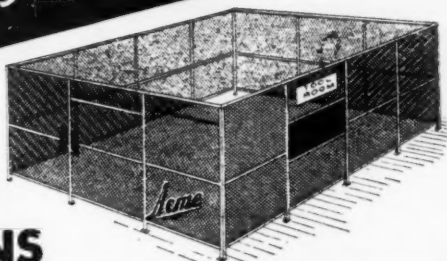
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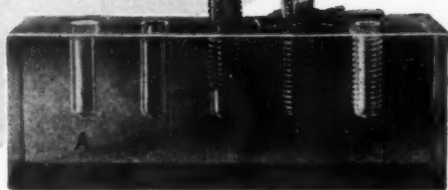
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## CHIPS. . . can't interfere here!



Hard wax TAP-CARTRIDGE is dropped into drilled hole: hole is tapped through TAP-CARTRIDGE: chips are imbedded in wax and forced out of hole. Chip interference in blind hole tapping is ended.

### TAP-CARTRIDGES simplify blind hole tapping

- Very economical
- Saves time and labor
- Eliminates torn threads
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- No cleaning-out operation required
- Facilitates thread-cutting to bottom of hole
- Available for tap sizes from No. 6 up and for any depth of drilled hole

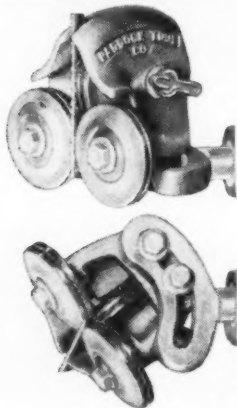
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**THE TAP-CARTRIDGE CO.**

1638 CENTRAL PARKWAY, CINCINNATI 10, OHIO

### **Paddock band saw guide**

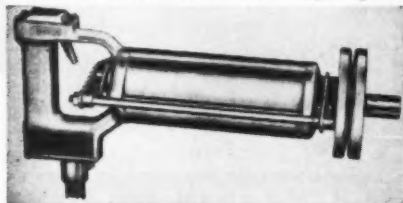
Paddock Tool Co., 1418 Walnut St., Kansas City, Mo., announces a new model saw guide as an addition to their line of ball-bearing band-saw guides. A feature of this new guide is that it holds the blade at any angle.



The three ball-bearing wheels in each guide reduce the danger of saw-blade breakage; they hold the working portion of the blade so that more work can be performed; and the blade can be held at any angle. When 36" band-saw machines are equipped with the new Model 20 set of guides and the blade held at an angle of 45° angle, material can be cut to any length. The guides are easily adjusted to the width, thickness and the desired angle of the blade.

### **Electromagnetic hammer drill**

A new Electromagnetic Hammer Drill the Model No. 17-RO for high speed



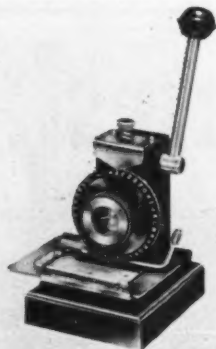
hole drilling in concrete, brick and stone, has been added to the line of electric hammers and hammer drills

manufactured by the Syntron Company, 300 Lexington Ave., Homer City, Pa. The No. 17-RO has a 1½" drilling capacity, weighs 21½ pounds, and is available for operation from 110 volt or 220 volt a.c.

Automatic rotation of the carbide-tipped, spiral-fluted drill speeds up hole drilling, eliminates manual turning of the drill chuck and reduces operator fatigue. This automatic rotation of the drill bit is accomplished by a rubber ratchet mechanism actuated by the recoil of each blow of the hammer's piston (3600 blows per minute). The new tool is a powerful hammer for quantity hole drilling installing machinery or hanging heavy pipes and ducts in factory maintenance and installation work, according to the manufacturer.

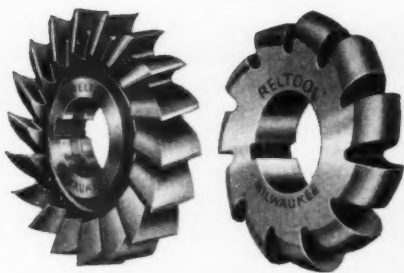
### **Clearview nameplate press**

An ingenious and durable nameplate press has been introduced to the industrial field by The Clearview Company, 182 Stanton St., New York 2, N. Y.



This useful equipment stamps neat, uniform characters with fully automatic letter spacing on machinery detail plates, identification plates, keys, metal tags, directory panels, etc. The standard hardened steel dial is furnished with 40 legible, sharp face characters. The Clearview Nameplate Press accommodates plates up to 2"x3". It is manually operated, and is provided with adjustable depth control. Parts are nickel plated throughout. The unit carries a one year guarantee.





## a Reltool Cutter for Every Milling Operation...

Reltool offers a Full Range of Milling Cutters in all Types and Sizes for every standard milling operation, and for many special applications. This includes Keyseat Cutters — both Shank and Arbor Types; Plain and Heavy Duty, Side and Half-Side, Staggered Tooth, Helical, Angle, Shell End, Single and Double-Angle, T-Slot-Straight and Taper Shank, Dovetail — 45° and 60° Angle. Convex, Concave and Corner Rounding Milling Cutters are available in both the Old Standard and in the New M.C.T.I. Standards.

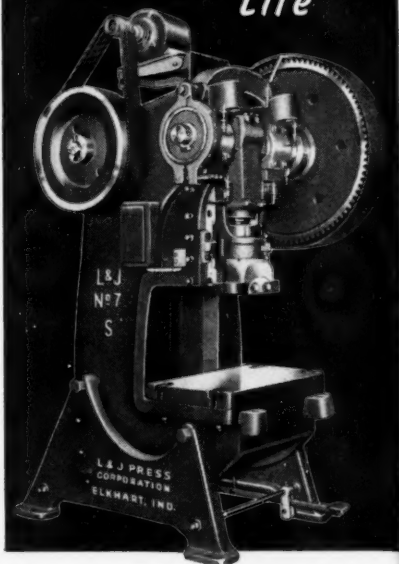
*The Reltool Line Includes:* Arbors • Center Drills • Counterbores • Die Sinking Cutters • Dovetail Cutters • End Mills • Form Tools • Gear Cutters • Hollow Mills • Keller Cutters • Key Seat Cutters • Lathe Mandrels • Metal Slitting Saws • Milling Cutters — all types • Reamers • Spottacers • Step Drills • Taps • Tool Bits • Specials.



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## L&J PRESS CORP.

1625 Sterling Avenue, Elkhart, Indiana

### Variable speed countershaft drive

A new Countershaft Drive which provides wide speed variations for a variety of applications is offered by Speed Selector, Inc., 118 Noble Court, Cleveland 13, Ohio. This new variable speed drive is designed for installations where driven shaft speeds must be lower than motor shaft speeds. This unit utilizes 7" and 8" combination sheaves and is available for drives from 2 to 15 h.p.



The assembly consists of a sealed ball-bearing countershaft stand, secured by rigid slide rods to an adjustable motor support for all motor sizes up to NEMA 326. The built-in control can be mounted in any one of a number of positions to suit the requirements of the installation.

The Speed Selector Countershaft Drive is designed so that the complete assembly with combination sheaves may be used, or parts of the assembly may be combined into other types of drives. For example: The various parts can be assembled as (1) a sliding motor base only; (2) a sliding countershaft base; (3) a fixed-center countershaft drive for ratios up to 8:1; or (4) a compound variable drive with speed changes up to 64:1. Remote control devices are easily adapted to this unit. Neither the multi-groove sheave nor the motor are furnished by the manufacturer.

### Fire-resistant, rust-proof roofing

By mixing aluminum powder and asbestos with a heavy-bodied black water-proof base, the Madison Paint Company Cleveland, has produced a fire-resistant, rust-proof roof coating called "Masticote" that is guaranteed to protect and waterproof old or new roofs for a period of ten years. This compound requires no heating equipment, and may be applied by unskilled labor, using either a brush or squeegee. "Masticote" is distributed by Ohlgren Associates, 1015 Russet St., Idaho Falls, Idaho.

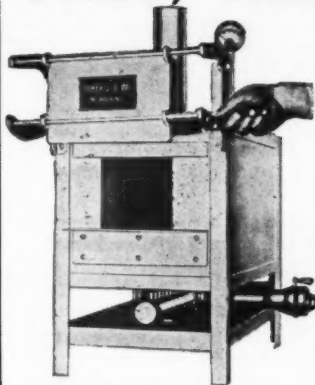
The aluminum and asbestos in "Masticote" combine to reduce fire hazards from falling sparks and embers—an important factor in industrial areas. The aluminum also prevents the color bleeding of the previous roofing coat, a problem which is often encountered when recoating old roofs.

"Masticote" actually acts as an insulating material when applied. The aluminum reflects summer heat to such an extent that some building interiors are from 20° to 30° cooler after the application of this roofing.



The new compound can be applied to wood, metal, concrete, gravel, paper, felt or previously coated roofs; 100 square feet of a good wood roof or composition shingles can be covered with 2½ gallons; a smooth metal roof with 1½ gallons. "Masticote" is furnished in quantities as small as one gallon. Brush or squeegee applicators are furnished free with all orders over 35 gallons.

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**ATMOSPHERIC BURNERS.  
NO NOISY BLOWERS, NO PARTS TO WEAR OUT  
1500° F IN 15 MINUTES AND 1900° F IN ONE HOUR  
ONE CONNECTION ONLY  
ALL MODELS COMPLETE WITH ACCURATE  
PYROMETER AND THERMOCOUPLE**

### **\$160.00 Complete**

Model No. 2 Bench Type  
Maximum Temperature 2000° F.  
Heating Chamber 7" Wide,  
12" Long, 5 3/4" High.

DESCRIPTIVE BOOKLET LISTING ALL MODELS  
INCLUDING HYDROGEN ATMOSPHERE FURNACE  
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NEW YORK**

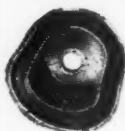
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## **EISLER CAM**

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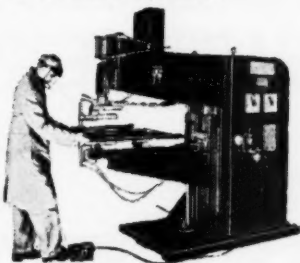


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MILLING SERVICE...  
JIG BORING... SPOT  
WELDING... CON-  
TRACT PRODUCTION  
... EXPERIMENTAL  
DEVELOPMENT**



\* Consultation without any obligation  
on your part is cordially invited

**For all types of welding in  
sizes: 1/4 to 300 KVA. Foot,  
air or motor operated.**



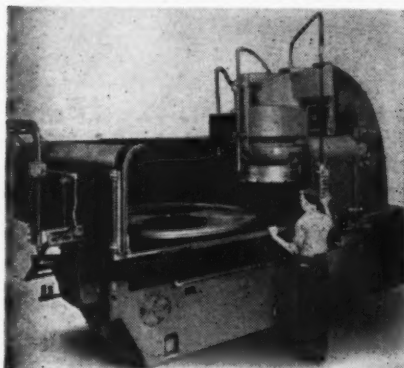
**We invite contract spot  
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in large or small quantities.**

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762 South 13th St., (Near Avon Ave.)

**Chas. Eisler, Pres.**  
**Newark 3, N. J.**

### Blanchard surface grinder

The Blanchard Machine Co., 64 State Street, Cambridge 39, Mass., announces a new, large surface grinder which has been added to their standard line. This rotary table, vertical spindle grinder is designated the Model No. 42-72-84. The

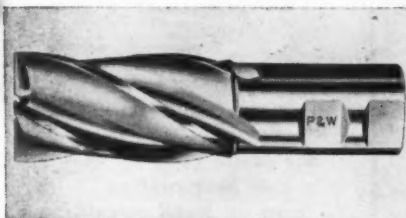


wheel spindle carries a 42" diameter abrasive wheel. The chuck, or work table is fully magnetic, 72" in diameter, and machined from a solid steel disc. A 6" wide extension ring around the table is non-magnetic and increases the table diameter to a total of 84 inches.

The wheel spindle can be equipped with either a 75 h.p. or 100 h.p. built-in electric motor. This new, massive grinder is 10' 7" in width and 20' long, and weighs over 30 tons.

### P & W heavy duty end mills

Heavy duty end mills with 2-inch diameter shanks and fast-cutting helix are the latest addition to the line of



"Hi-Helix" End Mills manufactured by Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford 1, Conn.

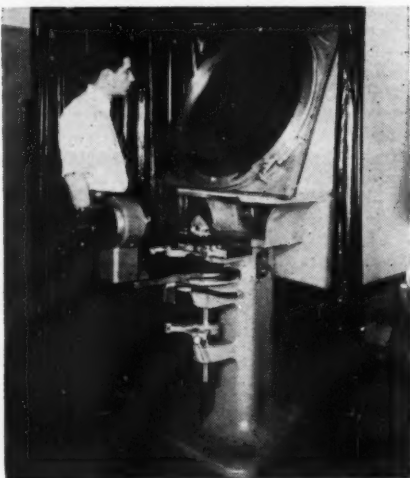
These cutters are of rugged design and have ample chip clearance for taking heavy end milling cuts. They are stated to be suitable also for Kellering, die sinking and similar work. Shanks are of the Weldon type and have two set screw flats for positive drive.

The cutters range in diameter from 2" to 2½", and in length of cut from 4" to 6". They are made of high speed steel with right hand cut and right hand spiral flutes.

### J & L optical comparators feature new projection lens

The Jones & Lamson Machine Co., Springfield, Vt., has recently perfected a five magnification projection lens with a 6" aperture and a 12" focal clearance, for their Optical Comparators.

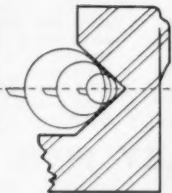
With this lens, the contour of any object which will fall within a 6" circle



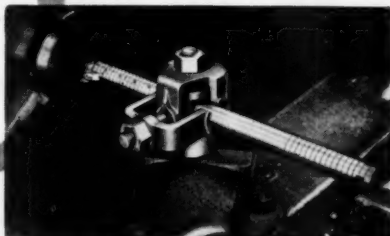
can be projected in its entirety onto the 30" receiving screen for measurement or direct comparison, with extreme accuracy and sharpness of outline.

The large aperture provided by Jones & Lamson's new lens now permits direct over-all inspection of a wide variety of relatively large objects. Typical applications include the inspection of cams, templates, air foil sections, and cutters.

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unique design  
**LICKS**  
boring problems



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- Nine sizes.
- 20 years of Craley experience specializing in boring heads.




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Fulfilling a need for standardization of turbine buckets, the Schellens Standard Series has been developed for high and low speed applications. These standardized buckets are manufactured by Schellens-True Corporation, Ivoryton, Conn.



The standard root is designed for strength, with the centrifugal loading of the bucket close to the center of effort of the root, avoiding tilting of the bucket. It is believed that there is no stronger root of the circumferential wheel slot type. This also allows ideal pitch, a feature not possible with the axially slotted types. The integral shrouds are machined on the periphery after assembly, resulting in a continuous surface without gaps or rivet heads. An exclusive feature is a high-speed ket bucket design producing an unbroken, continuous spacing without gaps and without sacrifice of strength.



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*Model S-VT*  
18,000 RPM



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A development filling a distinct need. Produces remarkable results on real production work when abrasive rolls and pencils, also bands, etc., are used. Flexible air-control lever for starting and stopping. Husky, light weight, 14 oz. Power to spare. Special grease-sealed bearings. Will handle many applications, also with "High-Speed" Rotary Files.

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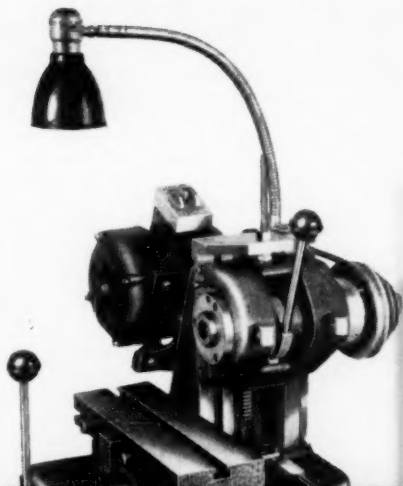
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# M-B

46 VICTOR AVENUE  
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October, 1951



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**VIMCO MFG. CO., Inc.**

Since 1919

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### New lightweight Adjustoveyor

The new lightweight Adjustoveyor is a companion unit to the basic model Adjustoveyor introduced by Stewart-Glapat Corp., Zanesville, Ohio (Machine and Tool Blue Book, April 1951, pp 292-293). The unit is designed for applications not requiring the extreme lengths and massive load carrying capacity of the regular Adjustoveyor,

The lightweight model Adjustoveyor will assume countless different positions and lengths, and can be easily handled by one man. It is counter-balanced for ease of handling, and can be moved to different applications around the factory. Its versatility is applicable to almost all operating conditions and locations, making it several conveyors in one.

The construction features a heavy truss design to carry a total weight of 850 lbs. and a maximum unit weight of 300 lbs., plus a ball bearing mounted

roller bed on which the belt rides. The unit measures 10' closed and 17'6" fully extended, and can be operated at any distance in between. It will stack to a height of 10', at a maximum stacking angle of 30°.



Standard equipment includes a 14" wide rough top rubber belt on an 18½" bed, which permits carrying wider loads than the total belt width. The unit weight is 625 lbs. completely assembled, and is driven by a ½ or ¾ h.p. motor.

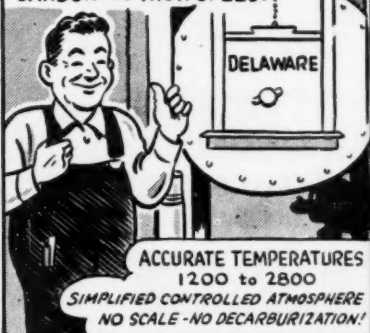


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**DELAWARE TOOL STEEL CORP.**

WILMINGTON 99, DELAWARE

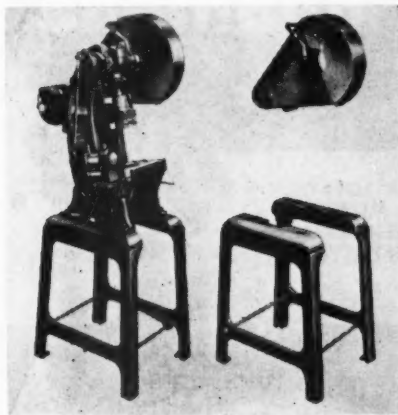
SEND for informative Bulletin F-1. It gives you the straight facts about the DELAWARE CONTROLLED ATMOSPHERE FURNACE.

**Punch press legs and guards**

Benchmaster Manufacturing Co., 2952 W. Pico Blvd., Los Angeles 6, Calif., offers a new series of belt guards in three sizes, especially designed for use with the Benchmaster 1 ton, 4 ton standard, 4 ton deep throat and 7½ ton

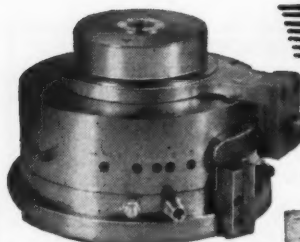
punch presses. The belt guards are equipped with suitable mounting brackets for use on respective presses and insure extra operator safety.

An additional Benchmaster product is the newly designed cast iron legs. These may be used with both 4 ton presses and the 7½ ton press illustrated (left). Wide spacing of the feet insures unusual stability. The legs are equipped with a pedal which connects to the clutch for convenient foot control.



**Hendley Blackmon** has been named manager of engineering association activities for the Westinghouse Electric Corp., Pittsburgh 30, Pa. He will work with Westinghouse engineers in the preparation of papers to be presented before engineering association meetings.

**S. C. Palmer** has been named manager of the transportation sales department, Westinghouse Electric Corporation, Pittsburgh 30, Pa. He succeeds **J. A. Schoch**, who has been appointed consulting engineer for the company's Transportation and Generator Division.



RC-5

## **Redmer** INDEX CHUCK

with Air Operated Collet

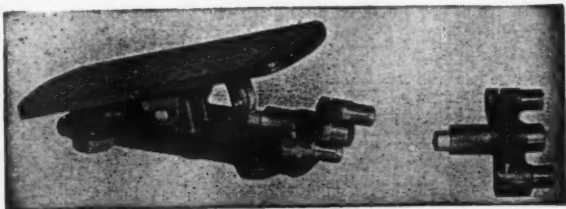
Uses Brown & Sharpe type collets. Capacity:  
1/16" to 2".

No. FC-28

V-29

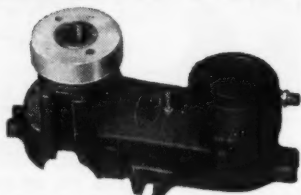


**Air Foot Control  
and Valve**



## **COLLET AIR CHUCK**

Uses Brown & Sharpe type collets. Capacity 1/16" to 3/4".  
Write for literature and prices



**REDMER AIR DEVICE CORPORATION**

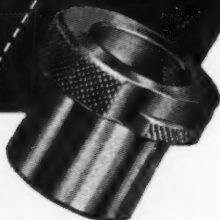
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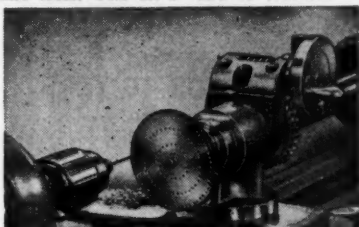
**GREEN INSTRUMENT COMPANY**  
386 PUTNAM AVE. CAMBRIDGE, MASS.

## Jig Boring on Lathes!

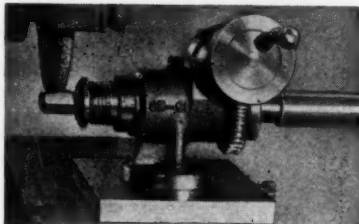


Handles work in the horizontal plane at any angle to lathe spindle.

You can now do jig boring with this revolutionary vertical rotary attachment—the DU-ONA-LATHE. Ordinarily possible only with jig-borer. Accurate to 1/10th of 1". Performs many jobs—drilling, reaming, flycutter facing and jig fixture work. Excellent as surface grinder to form triangles, hexagons or odd shaped punches and tools. Fits all 9" and 10" lathes.



Drilling accurately spaced hole patterns on a lathe.



Grinding hexagon punch from round bar stock on surface grinder.

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Costly handling operations are eliminated when parts are delivered automatically to work position. Motorized hopper. Parts arranged and fed as required. Send sample of part to be fed when writing for quotation. No obligation.



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Production Job, Have on Hand



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**THE DRY LUBRICANT**  
in the Handy  
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Purified Molybdenum Disulfide packaged for convenient use in 8 oz. waste-proof, shatterproof bottles with dispenser caps.

Stop scrapping parts and tools on account of seizing, galling and corrosion fretting with Moly-Lube, the lubricant that does the job at HIGH PRESSURES, HIGH VELOCITIES, EXTREME TEMPERATURES ( $-150^{\circ}\text{F}$  to  $+750^{\circ}\text{F}$ ).

$\frac{1}{2}$  lb. Bottle, \$3.75; 2 to 10 Bottles, \$3.25 each; 2 oz. TRIAL SIZE, \$1 Prepaid.

**MOLY-LUBE PRODUCTS**  
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## RUNS COOL AT 38,000 R.P.M.

Roto-Master Hi-Speed grinder makes carbide roughing and finishing available to every shop. Designed for operations requiring precise "finger-tip" control. In conjunction with carbide burrs and mounted wheels from  $\frac{1}{8}$ " to  $\frac{1}{4}$ " dia. Operates on 110-120 Volt AC or DC, any cycle.

Roto-Master's SUPER COOLING system enables operating speed of 38,000 RPM. Operation requires practically no pressure . . . consequently grinder can be used continuously for hours without heating. Try Roto-Master in your shop. If not completely satisfied return within 15 days at no charge. If not rated send check or M. O. for \$32.50.

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ROUGHING AND  
FINISHING AVAILABLE  
TO EVERY SHOP**



**\$32.50**

**MASTER APPLIANCE MFG. CO., 4th at Ontario, Racine, Wisconsin**



## THE KOCH TEST INDICATOR

IS THE ONLY TOOL MAKERS INDICATOR ON THE MARKET WITH TWO WORKING ENDS, FOR PRECISION WORK, ONE END TO TEST OUTSIDE SURFACES, THE OTHER INSIDE.



Plunger moves away from, instead of against the lever, protecting delicate parts from sudden or excessive jolts. Each graduation on scale represents 1/1000" movement of plunger. \$6.50

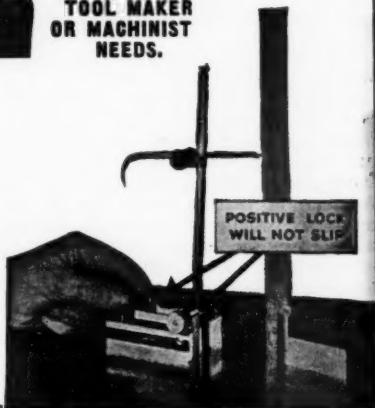
### Positive-Lock SURFACE GAGE

Drawbolt has positive lock to prevent slippage. Spindle: 9"x5/16". Block: 3 1/4"x2 1/2"x1" with 90° angle groove in base. Surface Gage is precision ground. \$8.00

Ask your dealer for these tools and buy through him. If he can not furnish them, write to us.

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TOOL ROOM  
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## MULTI-DRILL

Increases Capacity  
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ADJUSTABLE TO ANY HOLE PATTERN  
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If your production requires drilling from 2 to 8 holes in a work piece, a MULTI-DRILL will cut costs and speed output up to 800%. The MULTI-DRILL is universally adjustable to any hole pattern — is compactly built to permit easy, unhampered operation with drill jigs or other special fixtures. Ruggedly built to take the wear and tear of high production work, the MULTI-DRILL will handle your long and short run multiple drilling jobs with ease and economy. The MULTI-DRILL will drill on hole centers as close as 1/8" — handle drill sizes up to 3/8" in steel. Special adaptations available.

There is a Commander MULTI-DRILL Distributor in your area. Write for his name, literature and complete details.

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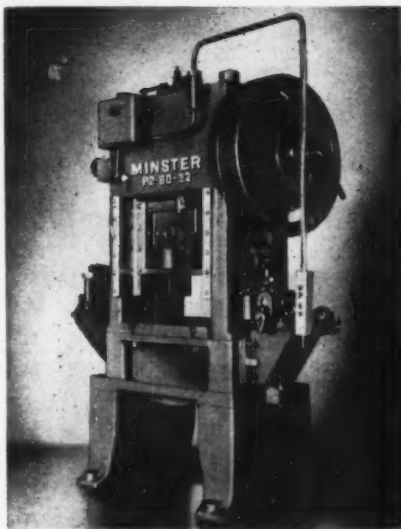
Chicago 24, Illinois

Product of *Commander* . . . Builder of Production Tools

### Minster production press

The Minster Machine Company, Minster, Ohio, presents its new automatic production press, the "Piece-Maker." The manufacturer states that this new unit is designed to meet rigid press requirements for the accuracy of alignment needed to produce intricate stampings with the finest progressive dies.

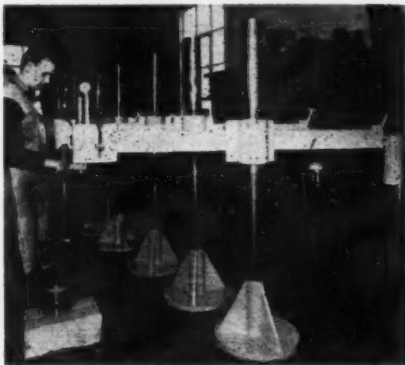
The new Minster press is equipped with a flywheel-type combination air-operated friction clutch and brake. It is available with pendant, pedestal or press mounted clutch controls. Four extra long gibs with eight guiding surfaces control the slide in two directions. Adjustable bronze ways are provided on each corner of slide. The press is also equipped with long sleeve-type manually-operated slide adjustment; four piece tie rod construction; and feed and auxiliary equipment to meet production needs.



The "Piece-Maker" has a double throw full eccentric shaft, is offered in the flywheel type and in a capacity range from 20 to 150 tons. All P2 Series Presses are offered with variable speed drives having speed ranges to fit the size and use of the press.

### Radial type stud and nut drivers

A new line of radial type Stud and Nut Drivers has recently been introduced by Johnson Tool and Engineering Co., 3668 Airline Road, Muskegon, Mich. These new machines are ruggedly designed with a 4½" solid column. The distance from the center of the column to the spindle is 70". The drivers are provided with a 1"x5" slide, travelling on four ball races, with cam adjustment for take-up. The actual spindle travel is 6"x2" diameter.

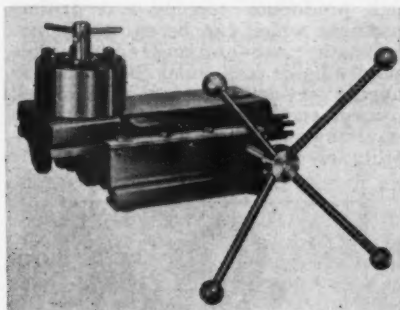


As is shown in the above illustration, a special bracket is mounted on the end of the spindle, for a unit to be used; a counterweight on the opposite end of the arm balances with the unit to be used. To increase facility of use, radial thrust ball races are provided in the head casting around the column. An adjustable stop collar holds both the head casting and the arm in place. A total column travel of 360° is provided for by a gear segment and rack on the spindle for travel of head. The Johnson Stud and Nut Driver weighs approximately 800 lbs. without the driving unit. These units are completely adaptable for all air or electric tools, according to the manufacturer.

### Improved precision bed turret

Model changes and improvements in the heavy duty Newton Precision Bed Turret have been announced by A. K. Tool Company, 2029 Blake Ave., Los

Angeles 39, Calif. For nearly a decade, owners of small lathes have relied on the Newton Bed Turret to provide maximum tooling for production work.



The new models are designed to fit 10" and 11" Logan lathes, 10" Powr-Kraft, 14" Atlas and 12" Craftsman lathes. The new models feature pilot wheel operation. Both the pilot wheel and lever-operated models are available.

The all-steel turret head accommo-

dates six tool positions and is self-indexing. Precise repeating accuracy is assured by a hardened and ground tool steel mechanism. The slide and bed have ground bearing surfaces to assure stroke accuracy. All production operations can be performed with this bed turret, plus many operations normally accomplished with the regular tailstock.

#### Waterproof covers for machinery

The South Bend Lathe Works, South Bend 22, Ind., is offering a new plastic waterproof service cover for the protection of machines against the harmful action of grease, water and dust. These attractive maroon covers have machine stitched bound edges to insure sturdiness and long life. They are ideal for factories and machine shops, or wherever machinery may be standing idle, and suffering the damages caused by grit and moisture. These plastic covers come in six sizes: 12"x28"x28"; 21"x37"x24"; 32"x48"x17"; 32"x60"x17"; 38"x72"x25" and 38"x96"x25".



### THIS SIMPLE, SURE-ACTION FEATURE GIVES EXTRA SAFETY

**JOHNSON** puts the exclusive **SAFETY TRIP** on all models of Power Presses at no extra cost! This patented non-repeating device uses two springs to hold release lever up. If one fails, the other takes over. If both fail, clutch automatically disengages. Springs replaced in 30 seconds without stopping machine.

*Johnson*

**MACHINE  
and PRESS CORP.**

620 W. INDIANA AVE. • ELKHART, IND.

IF YOU THINK SAFETY FIRST, think first of Johnson. Write for information on 8 models of open-back inclinable Power Presses now available. Ask about the new extra capacity, extra power No. 55 Press.

## CONVERT YOUR LATHE FOR PRODUCTION

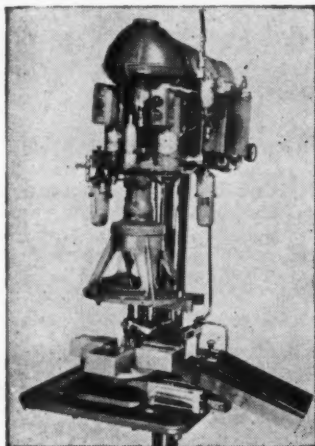
You can convert your lathe to handle profitable turret lathe and screw machine work by installing a self-indexing Newton Precision Bed Turret. All production operations can be performed, plus operations normally done with the regular tailstock. ☆ It's designed for fast, heavy duty operation, accommodates six tools and offers precise repeating accuracy. The slide and bed have ground bearing surfaces to assure stroke accuracy. ☆ Investigate the profitable opportunities offered by a Self-Indexing Newton Precision Bed Turret. Available in lever-operated or pilot wheel models for the following lathes: 10" and 11" Logan, 10" Powr-Kraft, 10" Atlas, and 12" Craftsman. ☆ Favorable delivery dates. Ask your dealer for information or write direct.

--- A. K. TOOL COMPANY 209 Blake Avenue • Los Angeles 39, California ---



## Air-controlled tapping-drilling machines

The Beckett-Harcum Co., 1140 Wayne Road, Wilmington, Ohio, has introduced high production tapping and drilling machines which can be equipped with automatic, air-controlled multiple spindle heads and index tables. These tapping and drilling units are designed to meet customer's specific production requirements and to provide great flexibility of operation.



Multiple tapping can be performed direct from a multiple drill head, without lead screws or clutches. Very light air pressure permits the taps to provide their own lead. There is no forcing of the tap and no galling action results. Threads produced are exact duplicates of the taps used. Both Class 2 and Class 3 fits can be obtained in soft metals such as magnesium and soft plastics, as well as in stainless and chrome molybdenum steels. Multiple tapping is accomplished with a high-reversal motor which reverses the taps when they reach desired depth. Tapping depth can be accurately controlled. By reversing the motor, taps lead out without stripping the last thread, even in extruded holes in very soft metals. The motor is capable of a complete cycle every three seconds.

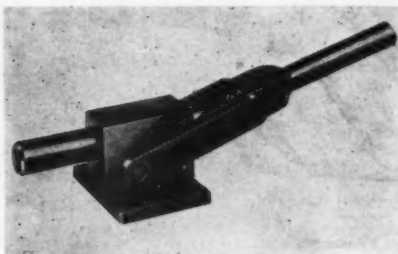
By switching out the motor reversing control, drilling operations can be performed and the same fixtures used for drilling may be used for tapping by removing the drill bushings.

Speed of both the forward and return spindle stroke is infinitely variable and a hydraulic break-through cushion is provided for controlling break-through in drilling uneven surfaces. In a drilling operation, any desired air pressure can be obtained up to 1250 pounds using a 100-pound air line.

Various types of index tables or shuffleboard work feeders can be supplied to suit customer job requirements. Index table is electrically interlocked with the spindle stroke. Work cannot index until spindle is in full up position and spindle cannot descend until work table has indexed to proper position.

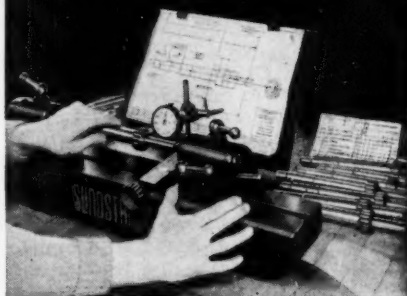
#### Heavy duty toggle clamp

A new, large push-type toggle clamp for larger, heavier fixtures, is being produced by the Wolverine Tool Co., 1486 E. Woodbridge Ave., Detroit 7, Mich. This clamp, No. 132-A, is especially suited for use in production of such large items such as planes, tanks, armored trucks, etc. It has a plunger 1" in dia. with a 2½" stroke; the ultimate load 10,000 lbs.



Constructed of solid bar stock, these clamps are stated to be able to stand heavy duty operation and provide long, efficient service. The ground plunger and broached guide hole permit accurate locating as well as clamping operations.

## Keep a Close Check On Accuracy With SUNDSTRAND Bench Centers



Simplify assembly, lower spoilage and get better production from this modern Sundstrand Bench Center. You'll check work between centers easier, faster and within limits of .0001" on this improved Sundstrand Bench Center.

"One-hand control" over all movable elements leaves the operator's other hand free to control rotation of the part being checked. Either headstock or tailstock can be unclamped, positioned and locked in place with a single hand operating the top lever. Investigate this bench center today.

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6" x 18"	12" x 48"	24" x 48"
6" x 36"	12" x 60"	24" x 60"
12" x 36"	12" x 72"	24" x 72"

#### FREE Additional Data

covering complete specifications and additional features is contained in this bulletin. Write for your copy. Ask for data sheet #12.



**SUNDSTRAND MACHINE TOOL CO.**  
2535 Eleventh Street, Rockford, Ill., U.S.A.

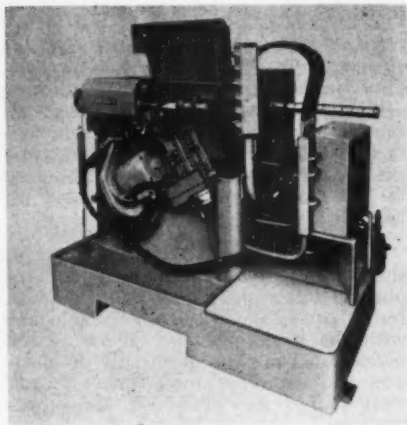
### Ex-Cell-O machine grinds jet compressor blades

Ex-Cell-O Corporation, Detroit 32, Mich., announces that a standard machine for grinding the airfoil form on jet aircraft compressor blades is now available.

The machining cycle is automatic except for loading the work, pressing the start button and unloading the work at the end of the cycle. Blades are located from the finished root form (as ground on the Style 85 Ex-Cell-O Two Wheel Form Grinder) at one end and from a center in the other end. Accuracy of airfoil form is assured by the use of master cams made directly from the engineer's glass layouts. The coolant equipment also has automatic controls.

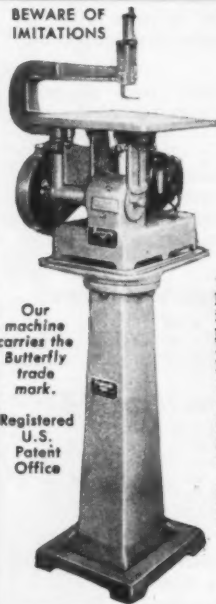
The Ex-Cell-O Style 87 Precision Profile Grinder grinds the complete airfoil form including the leading and trailing edges. As the work rotates, it moves lengthwise across the grinding wheel at an adjustable feed rate. Since the area of contact between the

work and grinding wheel is very small at the leading and trailing edges and quite large at the broad sides of the



blades, the work speed changes as the blade rotates. A two-speed work drive motor slows down while the grinding

BEWARE OF  
IMITATIONS



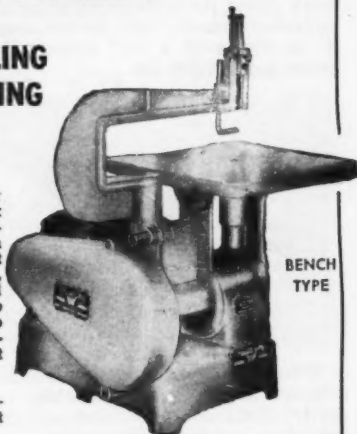
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### USE BUTTERFLY FILING AND DIE MAKING MACHINE

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This is a powerful machine, for heavy or small precision work in use all over the world: Airplane Factories, Ammunition Plants, Toolrooms where fast production is desired. 4 Models, No. 16, No. 14, "EL" and Model "D". The larger the model, the larger the stroke and therefore more filing is performed, furnished with or without pedestals.

Constructed as per Specification of U. S. Naval Aircraft Factories.



## HARVEY MFG. CORP.

Dept. H, 161 Grand St., New York Phone: CAnal 6-5170



wheel cuts the broad sides of the blades, then speeds up while the narrow edges are being ground. Thus there are two periods during which the fast speed is used and two periods of slow speed during each revolution, insuring a uniformly fine finish.

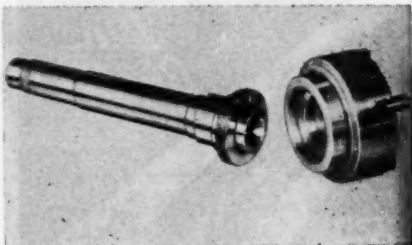
Ex-Cell-O Precision Grinding Spindles are available for any speed required and for any practical wheel size. The grinding wheel is dressed with a hand operated, swivel type diamond dresser. The amount of stock dressed off the wheel is compensated for by the wheel moving toward the work with an equal amount.

### Thread-lock lathe spindle nose

A patented Thread-Lock Spindle Nose is announced by the Wade Tool Co., Waltham, Mass., as a new and exclusive feature of their No. 8A Toolmaker's Precision Lathe.

The particular advantage of this patented Spindle Nose is that the chuck is located and locked with one simple half turn of a locking ring. There is no

chance of the operator leaving something undone, such as failing to turn a screw or cam. This Spindle Nose is said to be entirely fool-proof.

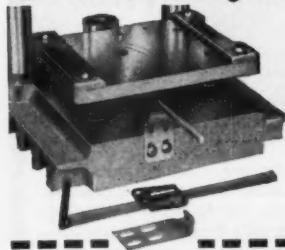


The Thread-Lock Spindle Nose secures chucks, faceplates, etc., to the spindle with absolute accuracy, repeatedly. It is rigid and completely safe, according to Wade Tool Co. For precision location, the American Standard Taper D1-3" is employed in conjunction with the Wade Thread-Lock principle. The use of differential screw threads develops tremendous force.

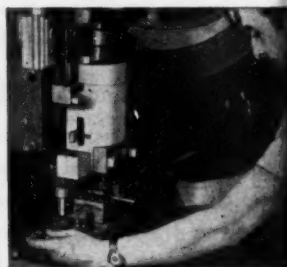
## Adjustable Automatic Stock

# FEED STOP for DIES

## Dahlstrom Light Duty AUTOSTOP



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Tested and improved through the years, the Dahlstrom Autostop will save hours of your high priced labor. Adjustable to work with blanking, progressive and compound dies. Mounts on stripper plate in 15 minutes. Handles sheet steel up to 1/16" x 6" or equivalent.

To Install: Just drill one 7/36 inch hole, then drill and tap four mounting holes per directions. That's all there is to it!

Trial order \$1.75 each; lots of 12 \$1.50. Write for free pamphlet.

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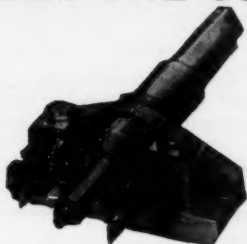
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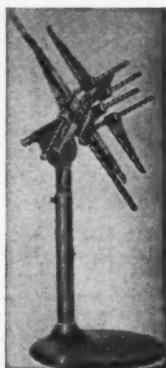
- Specify quantity and thread size.

load centering  
**EYE BOLT**

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## Universal Stock Reel

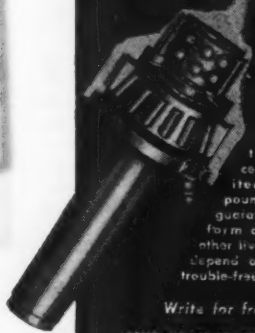
The Humm Universal Stock Reel is an essential device for the handling and feeding of coil stock to Power Presses.

1. Adjustable Reel to fit various sizes of coil.
  2. Reel is adjustable to suit height of Press.
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Manufactured By

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**MARVEL TOOL & MACHINE CO.**  
1096 North River Road • St. Clair, Michigan

## Clearing 1500-ton hydraulic press

Unusual flexibility for quick adaptation to a variety of work is a feature of a new Double Action Hydraulic Press recently built by Clearing Machine Corp., 6499 W. 65th St., Chicago, Ill. The press has a frame capacity of 1500 tons, the punch slide delivering 1000 tons and the blankholder slide 500 tons. Maximum stroke of the punch slide is 80" and the press is arranged to draw and lift out a 30-inch piece.



The bed is 96" by 162". An auxiliary filler plate or sub-bolster is supplied so that minimum shut-height may be as little as 20" for first draw or shallow die work. Removal of the auxiliary filler plate makes the minimum shut-height 50".

Three pressing speeds are available in addition to the quick advance and return. Each speed can be used singly in conjunction with the quick advance and return, or any sequence of pressing speeds can be used, so that in all, seven sequences of automatic operation may be chosen by means of selector switches on the control panel.

Relative positions of blankholder and inner slide may be adjusted to suit punches of any length without the

need for packing or blocking behind short punches. Movable lugs at each corner, with an arrangement of spaced keyways, permit adjustment by two inch increments.

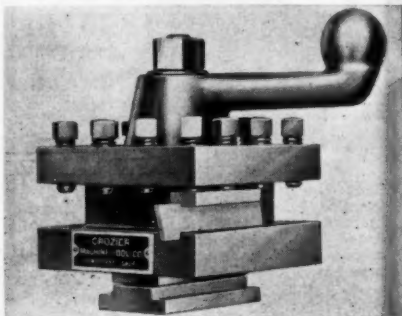
The press is equipped with three hydro-pneumatic cushions with independent pressure adjustment up to a maximum of 150 tons on each cushion. The cushion stroke is 30".

In anticipation of eccentric die loads, the punch slide of the press has been extended to obtain additional guiding in the crown of the press. An increased guiding ratio is obtained through this development which holds the slide rigidly parallel to the bed under any conditions.

The press is driven by two 200 h.p. motors mounted on the crown. All controls are concentrated at one corner of the press and all operating adjustments are from floor level including individual control of pressure on each corner of the blankholder as well as position of speed change or position of blankholder charging.

### 12-position index on tool post turrets

The addition of a 12-position index feature has been added to the tool post turret by the Crozier Machine Tool Co., Hawthorne, Calif. The turret may now be aligned with the work, with the compound rest of the lathe set at any 30° increment.



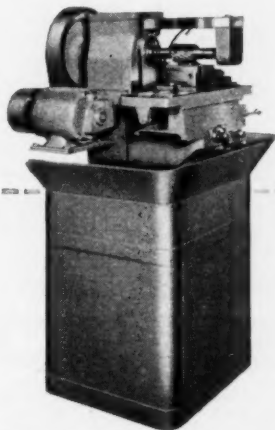
This feature further increases the speed and efficiency of bench, engine and turret lathe operation. Tool post

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DRILLING - BORING -  
HONING - TAPPING  
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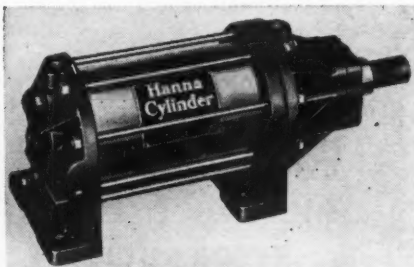
MOLINE TOOL COMPANY  
102 20th St. MOLINE, ILLINOIS

turrets, which were introduced by the Crozier Company many years ago, are now widely accepted in lathe operations as they eliminate the need of ordinary tool holders and require less set-up and less down time. The Crozier tool post turret comes with a cut-off tool and holder as standard equipment. The holder and cut-off tool may be removed to allow the use of four regular tools.

The new tool post turret is available in three sizes: Model 61 with a body 5 1/2" square, Model 41 with a body 4" square, Model 31 with a body 3" square. All are made from hardened steel and all are equipped with 12 position indexing.

### Hanna low-pressure cylinders

Below is illustrated a representative low-pressure cylinder manufactured by Hanna Engineering Works, 1765 Elston Ave., Chicago 22, Ill. The cylinder illustrated is model 4M, one of a complete line of Hanna LP Cylinders which operate by air, oil or water.



Among the features of Hanna LP Cylinders are a cork floater ring which facilitates cushion alignment with the head and insures a seal during cushioning; spring-backed chevron rod packings which are self-adjusting for consistently correct compression; the flange design permits removal of the front head without disturbing the mounting.

Hanna Low Pressure Cylinders are designed for operation up to 110 p.s.i. and, with minor modifications, for higher pressures depending on the cylinder diameter and operating medium (air, oil or water). Standard models permit the selection of a cylinder to meet most mounting requirements.



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**FOR DRILLING,  
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The inner race of the GATCO bushing rotates with the tool, piloting the tool accurately below or above the work—or both.

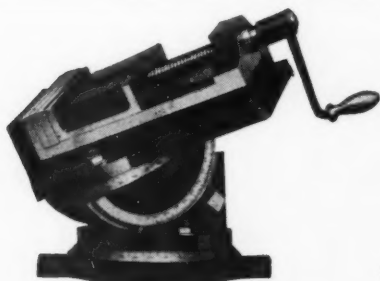
Eliminates expensive tool construction—Reduces tool wear—Prevents seizure and pilot breakage—Especially adapted where precision is required.

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on intricate, angular set-ups with the MASTER MULTI-SWIVEL VISE. Fully universal. 3 swivels instantly set any compound angle. Parts interchangeable. Optional accessory: Platen, interchangeable with vise. This vise used in machine shops throughout the world. Circular on request.

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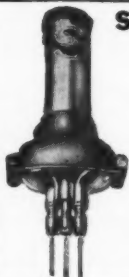
## **GROBET CHATTERLESS COUNTERSINKS**

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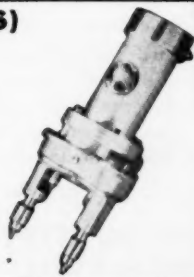
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No. OAD min. .65" max. 3.4" — 1/8" drill  
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WEAR  
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**Illustrated:**

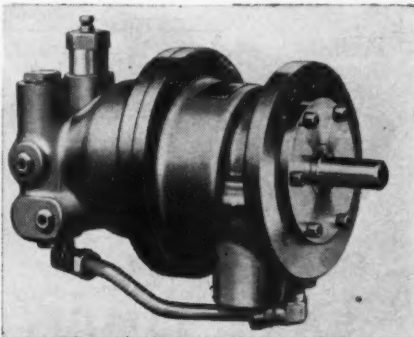
The DERBYSHIRE ELECT lathe with 18" bed; ball-bearing headstock with collet closer attachment; double compound rack-and-pinion slide rest with front tool post slide graduated to swivel 360°; six-position turret to take standard tools.

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**WALTHAM 54, MASS. 157 HIGH ST.**

### **Oilgear constant delivery pumps**

Simplification and compactness are exemplified in three new heavy-duty Type "HG" Axial Rolling Piston Pumps introduced by The Oilgear Company, 1559A W. Pierce St., Milwaukee 4, Wis. The pumps operate quietly at speeds up to 1800 r.p.m. Coupled with pressure and flood lubrication by the high grade oil in the system, they are claimed to set new standards of service and endurance for pressures up to 3000 to 5000 p.s.i.



These heavy-duty units are of the fixed stroke type, the volume of oil delivered varying with the drive shaft speed. Oil is delivered in one direction. Each compact unit consists of an axial rolling piston pump, a supercharging gear pump, a gear pump relief valve and an adjustable reverse flow type high pressure relief valve. Over 10 h.p. is transmitted by units only 7"x10"x13". About 135 c.i.p.m. excess gear pump oil at 100 p.s.i. is available for auxiliary purposes. Pump, work and machine are protected against overload.

On a variety of applications using repetitive cycles, and where controlled variable speed is not essential, these Constant Delivery Pumps will prove practical and economical according to The Oilgear Company. They are suitable for heavy-duty pushing, pulling, lifting and lowering applications, for maintaining high static loads on large clamping rams and the like.

## CONVERT ENGINE TO TURRET LATHES

quickly . . . easily . . . economically

Several sizes for lathes up to 24" swing. For forming, roughing, boring, drilling, tapping, finishing, etc. without stopping lathe or changing tools. (Attaches to tailstock spindle).

Send for catalog of Dividing Heads, Belt Sanders, Swing Grinders, Turret Attachments, etc.



JEFFERSON MACHINE TOOL COMPANY, 700 W. Fourth St., Cincinnati 3, Ohio

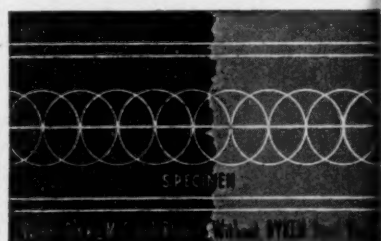
**WHO** The old reliable . . . Wm. H. Ottemiller Co. of course.

**WHAT** Precision, milled-from-the-bar Cap Screws, Set Screws, Milled Studs and Coupling Bolts.

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Wm. H. Ottemiller Co.  
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**making dies & templates**

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

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## THE DYKEM COMPANY

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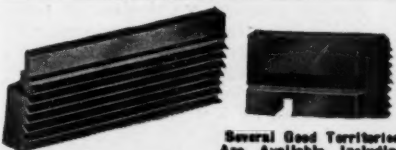
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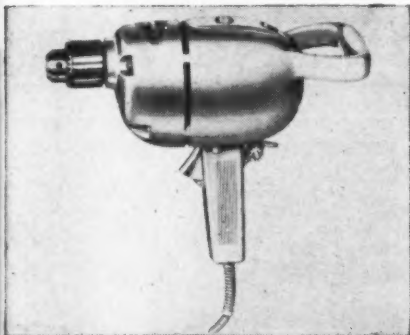
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### Cummins heavy duty drills

New items in the "Tools for Industry" Line of portable tools are two heavy duty drills—Model 427,  $\frac{1}{4}$ -inch and Model 230,  $\frac{3}{8}$ -inch. They are made by Cummins Portable Tools, Division of Cummins-Chicago Corp., 4740 N. Ravenswood Ave., Chicago 40, Ill.



Designed for constant day-in day-out production drilling of tough metals, the Model 427 (illustrated) is presented as having the maximum power and performance required by machinery builders, structural steel fabricators, truck body builders, and similar heavy duty operations. Specifications include a capacity of  $\frac{1}{4}$ -inch in metal,  $\frac{3}{4}$ -inch in hard wood; a no-load speed of 1750 r.p.m.; a Jacobs Model 7B geared chuck; the length is  $12\frac{1}{4}$ " overall; weight is 6 pounds.

Slightly heavier and with correct speed for fast drilling in all metals, the Model 230 is said to have ample power and ease of handling needed in production and maintenance operations. This drill is most frequently selected for use in metal fabricating shops for drilling and reaming rivet holes. Model 230 specifications include a capacity of  $\frac{3}{8}$ -inch in metal, 1-inch in hard wood; a no-load speed of 750 r.p.m.; a Jacobs Geared chuck, Model 32B; the length is  $13\frac{1}{2}$ " overall; weight is 8 $\frac{3}{4}$  pounds.

Both drills have universal motors for d.c. or a.c. up to 60 cycle—115 volts standard, 220 volts special; high grade anti-friction bearings throughout; double reduction gears of finest steel,

helical cut for quiet operation, and hardened for long life; 2-pole switch, momentary contact, with lock for continuous operation; a strong, lightweight, die cast aluminum frame; a 10-foot 3-conductor cord with rubber plug and pigtail for ground.

### Gauge checks circular saw teeth

A new gauge which is claimed to be the first accurate indicator ever released for checking the set of circular saw teeth is announced by PTI, Incorporated, 401 Broadway, New York 13, N. Y. This new dial gauge enables instant checking within .001" of the set of any type of saw blade tooth—rip, cross-cut, conventional or safety types.

In order to have a circular blade saw cut accurately and efficiently, it is important that the teeth are set accurately



With this new gauge every circular saw user can check the set of teeth on resharpened blades to make certain that an accurate sharpening job has been done. The dial gauge is two-faced precision built throughout and is unconditionally guaranteed. This unit fits into a combination gauge, which can be acquired separately, for checking the setting of planer, jointer and shaper knives.

## Greenerd ARBOR PRESSES

For Assembling  
Keyway Cutting  
Boreing  
Piercing  
Die Grooving  
Straightening  
Forming  
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And many other jobs

65 Standard styles and sizes  
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**SPIRAL-REINFORCED HOSE, LIGHT,  
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Flexaust is of proven suitability for a wide variety of suction and pressure uses in ventilation, fume and dust control.

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TO INSTALL —  
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USE**

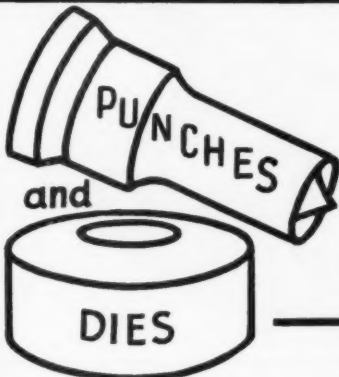
**SIZES 1 1/4" to 26" dia.**  
Various Flexaust types, accessories, and other hose types also available:

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100 Park Avenue  
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Over 65 styles are carried in stock; to fit most makes of punch machines, in a large range of round, square, flat and oval sizes.

**SPECIAL TOOLS MADE TO ORDER**

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SPEED (12 TO 35 FEET PER MINUTE)

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ESTABLISHED 1902

SEVELLY, MASSACHUSETTS

### Simmons No. 2 turret lathe

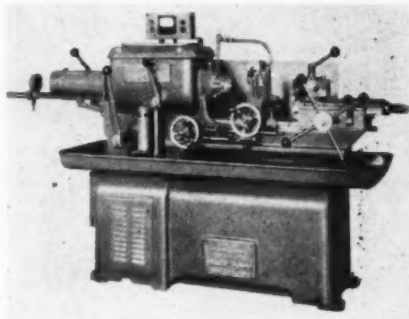
An improved, No. 2 turret lathe, with 1 1/4" bar capacity, utilizing standard assemblies and eliminating the complex devices required only for rare operations, is announced by Simmons Machine Tool Corporation, Albany 1, N.Y. The new lathes are designed for rapid production of precision parts and a variety of bar and chucking operations. They feature remote speed control, helical gears in the headstock, and an electrical tachometer that indicates spindle speed.

Speed changes are accomplished by push button operation. From normal position, the operator can read the tachometer and change speed instantaneously. The electric control permits an infinite range of reversible speeds; it also incorporates overload protection.

The lathe is equipped with spindle speeds of from 188 to 750 r.p.m., at back geared machine direct drive; with the back gears engaged, speeds are from 44 to 177 r.p.m. The automatic chuck capacity, with a round bar is 1 1/4"; with

a hex bar, 1 1/8", and 7/8" with a square bar. The lathe has a 7" wide bed, with ways 31" long.

The spindle is mounted so that opposed anti-friction bearings on the head end control longitudinal adjustment.



The precision roller bearing on the rear end allows for expansion without disturbing the spindle adjustment. Spindle drive is obtained through standard,

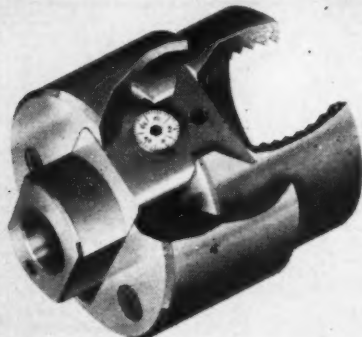
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THESE JOB-PROVEN FEATURES WILL  
SAVE YOU TIME AND MONEY

- Quick tool change
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- Rugged tool support
- Safety round contour

Complete Boring Chuck  
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WHEEL  
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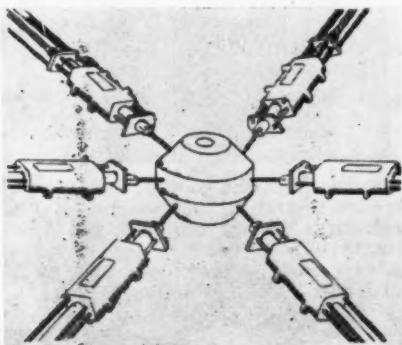
separable-link Vee-beltting. The spindle hole is 1½" in diameter.

The spindle clutch is of the multiple-disc type, adjustable for wear. An oversized brake operated by the clutch lever brings the spindle to rest quickly; locks it idle for changing work.

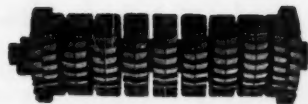
Power feed to the turret ram is provided through a three-speed gear box, and a worm and worm wheel mounted on the turret saddle.

#### **Commander Multi-Angle Drill unit has infinite adjustments**

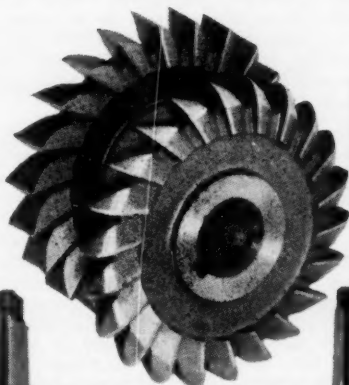
The Commander Manufacturing Co., 4227 W. Kinzie St., Chicago 24, Ill., has recently announced a revolutionary new drill unit designed to provide unlimited freedom of set-up in order to simplify and reduce the cost of drilling holes at any angle. Powered by a heavy duty flexible shaft with hydraulic actuation of the full 4" stroke, the new Multi-Angle Drill Unit is a compact drill head which is said to be easily mounted on jigs and fixtures, or built into special machines.



Quick, easy set-ups and infinite adjustments in drilling position, plus the Multi-Angle Drill Unit's long stroke are said to provide the user with a basic drill head that will save time, reduce piece part handling and cut drilling costs materially. Because of their compact design, a number of the Multi-Angle Units can be mounted on a jig or fixture to drill multiple holes in a single piece with considerable savings in time and production cost.



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## Lee tool and cutter grinders

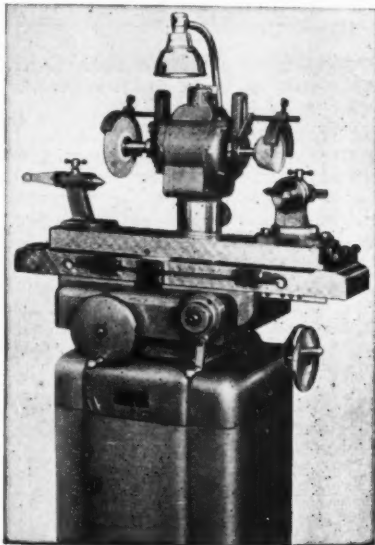
The new B800 Series of Universal Tool and Cutter Grinders has been introduced by the K. O. Lee Company, Aberdeen, S. D. The B800 Series includes four models: Model B800 Tool Grinder (illustrated), a basic tool and cutter grinder; Model B860 Universal Tool Grinder, equipped with slide mounted multiple speed head; capable of performing internal and external grinding operations; Model B803 Chip Breaker Grinder; and Model B804 Universal Carbide Tool Grinder.

The new Lee grinders are stated to have improved accuracy standards, greater capacities, 25% heavier construction, improved lubrication system giving longer life, and other refinements for easier operation. New engineering features have minimized time expenditures in making set-ups for many operations.

The specifications include a swing over the table of  $8\frac{1}{4}"$  (when using raising blocks,  $10\frac{1}{4}"$ ); distance between centers of head and tail stocks is  $18\frac{3}{4}"$ ; the table dimensions include a working surface of  $5\frac{1}{4}" \times 25\frac{3}{4}"$ ; the sub-table is  $6\frac{1}{2}" \times 30\frac{1}{4}"$ . The table calibrations on the left end are calibrated in taper-per-foot  $3"$  either side of center; in degrees,  $15^\circ$  either side of center. The table has  $360^\circ$  calibrations at center; table traverse is  $11\frac{1}{4}"$ ; fast feed (direct drive) is  $3\frac{3}{4}"$  per revolution of crank, slow feed (5:1 ratio) is  $\frac{3}{4}"$  per revolution of crank. The cross feed is  $6\frac{3}{4}"$ ; each revolution of the hand wheel is  $.100"$ , calibrated in thousandths. All shafts are ball bearing mounted; saddle

ways have automatic compensation for wear.

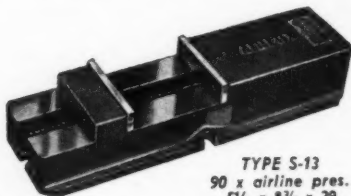
The wheel head swivels a full  $360^\circ$ , calibrated in degrees. The minimum distance, centerline of wheel shaft to top of table is  $3\frac{3}{4}"$ ; maximum distance is  $10\frac{1}{2}"$ . The distance from the floor to the center of the head stock is  $44"$ ; the maximum height of the machine with column extended is  $56\frac{1}{4}"$ . Maximum



distance from the column to the wheel is  $7\frac{3}{8}"$ ; vertical movement of the column is  $6\frac{3}{4}"$ , moving  $.040"$  per revolution of the hand wheel. Grinding wheels have a maximum size of  $6"$  diameter, with a  $\frac{5}{8}"$  diameter bore.

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 $5\frac{1}{4}" \times 8\frac{3}{4}" \times 2\frac{1}{2}"$   
Max. jaw opening  $12"$

**production devices, inc.**

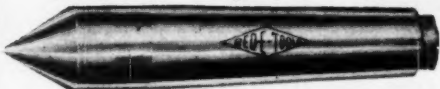
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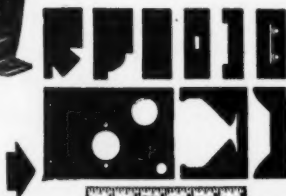
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CHICAGO



Diagram illustrates versatility of Press—each blanking done with 1 stroke.

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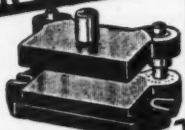
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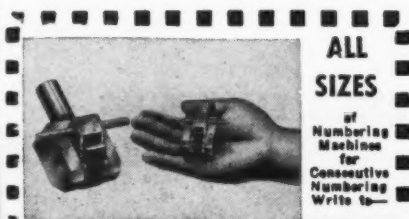
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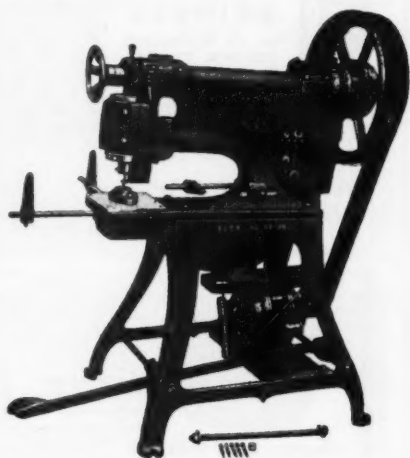
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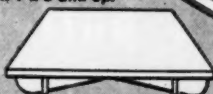


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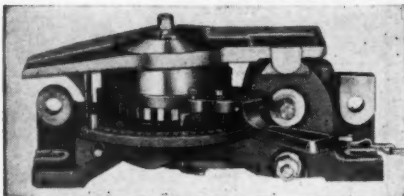
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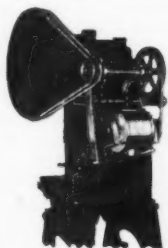
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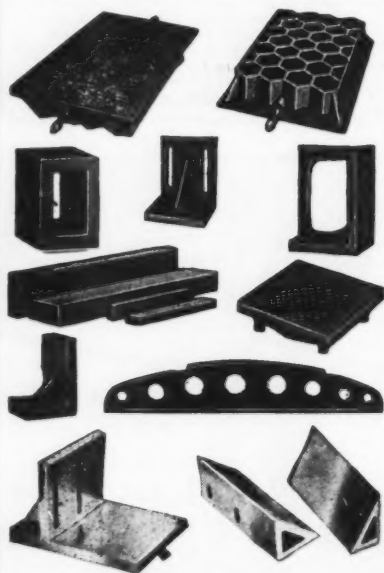
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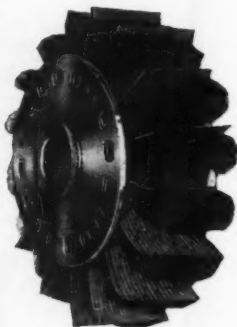
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A new portable brush-backed polishing head has been developed by the Vonnegut Moulder Corporation, 1819 Madison Ave., Indianapolis 25, Indiana.

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Since a different set of results may be obtained with the same head, simply by changing the grade and grit of abrasive strips used, its applications cover a wide range, including sanding wood, plastics, ceramics, leather; removing bubbles and other defects from paint finish coats; removing rust, scale and for other clean-up operations; for polishing out die marks on formed metal parts and smoothing die castings.

When size and shape permit, the head is said to be ideal for removing burrs and polishing surfaces of the dies and moulds which are used for making such parts; removing burrs from perforated stampings and fabricated wire products; polishing all kinds of ferrous and non-ferrous surfaces in preparation for buffing operations, etc.

The two end plates and central cylinder of the portable head are made of aluminum for weight reduction. Made in 4" and 2" widths, and 4" width (for 4" abrasive) weighs less than 6 pounds when fully loaded. The 2" nominal width head (for 2" wide abrasive strips) weighs less than 4 pounds with

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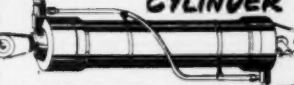


**1949**

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Positive displacement type, angle piston. Displaces .507 cu. in. per revolution. Has capacity of 6 gal. per min. at 3000 RPM at 1500 PSI, continuous, 1875 for 15 sec. Operating speed of 3750 RPM, intermittent maximum, 4500 RPM. Rotates to the right only.

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**2995**



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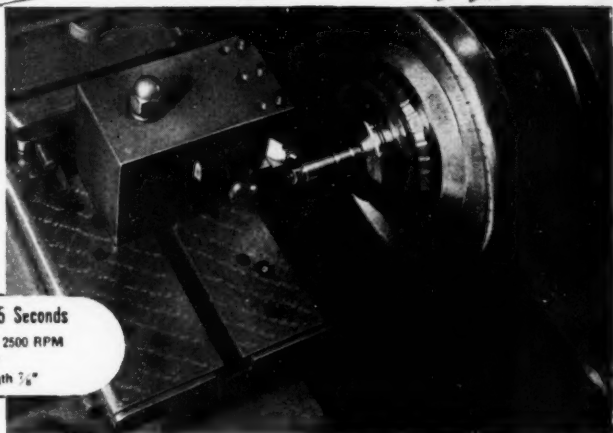
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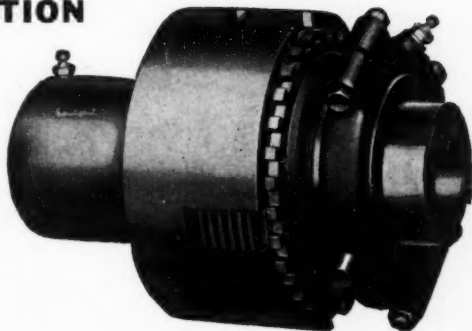
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No. By Gage	Length Inches	Our Price Net Each
1 to 10	6¼	\$1.00
11 to 20	5¾	.90
21 to 30	5⅝	.80
31 to 40	5¼	.70
41 to 50	4½	.60
51 to 60	3½	.50

Size Inches	Length Overall Inches	Length Flute Inches	Price Each Net
13/32	12	9	\$3.05
27/64	12	9	3.30
7/16	12	9	3.30
29/64	12	9	3.60
15/32	12	9	3.60
31/64	12	9	3.60
1/2	12	9	3.60

#### Straight Shank

Size Inches	Length Overall Inches	Length Flute Inches	Price Each Net
1/8	12	9	\$1.65
9/64	12	9	1.65
5/32	12	9	1.65
11/64	12	9	1.65
3/16	12	9	1.65
13/64	12	9	1.76
7/32	12	9	1.76
15/64	12	9	1.95
1/4	12	9	1.95
17/64	12	9	2.05
9/32	12	9	2.05
19/64	12	9	2.25
5/16	12	9	2.25
21/64	12	9	2.50
11/32	12	9	2.50
23/64	12	9	2.75
3/8	12	9	2.75
25/64	12	9	3.05

#### Taper Shank

17/32	15	12	\$ 7.15
9/16	15	12	7.70
19/32	15	12	8.25
5/8	15	12	8.80
21/32	15	12	9.00
11/16	15	12	9.10
23/32	15	12	9.35
3/4	15	12	9.50
25/32	15	21	10.50
13/16	15	12	12.00
27/32	15	12	12.65
7/8	15	12	13.20
29/32	15	12	13.75
15/16	15	12	14.30
31/32	15	12	15.40
1	20	15	17.60
1-1/16	20	15	18.70
1-1/8	20	15	19.80
1-3/16	20	15	22.00
1-1/4	20	15	24.00

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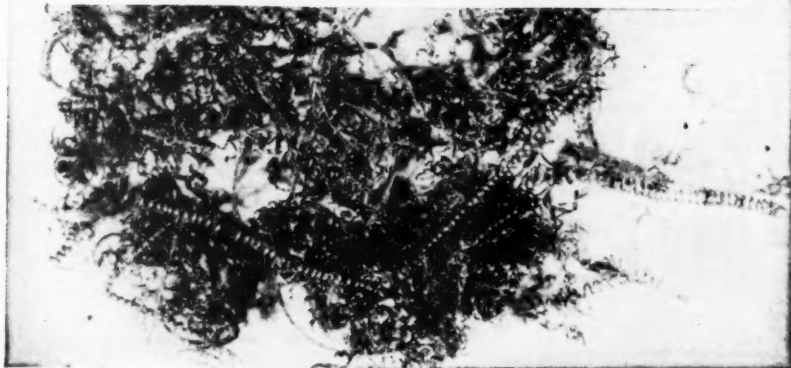
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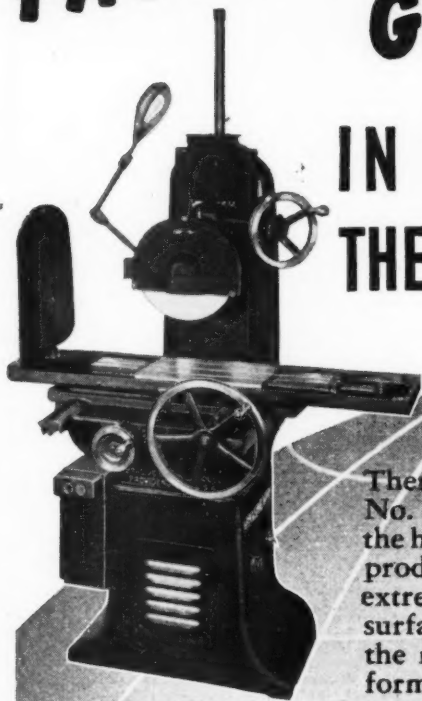
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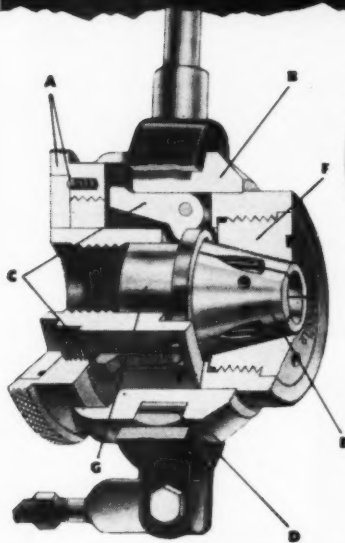


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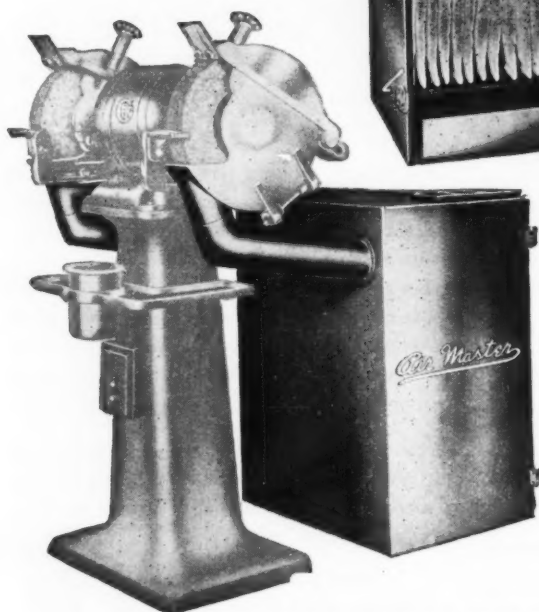
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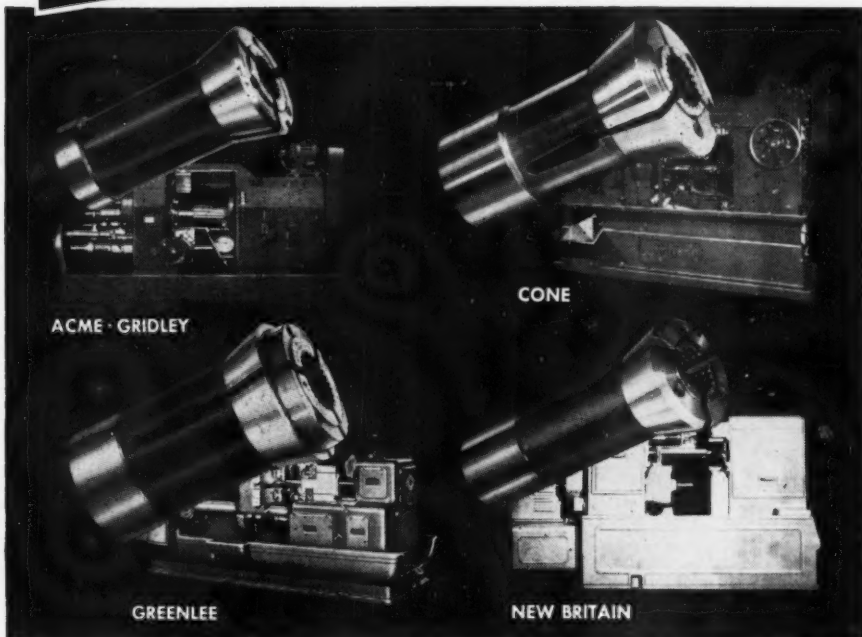
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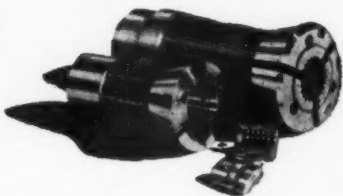


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